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EDITORIAL.

Malayan Soil Studies.

The fourth part of the series of Malayan Soil Studies, which is included in the present number, gives an account of field experiments conducted on quartzite valley soil which in the recent past had been under swamp conditions. The soil, which is fortunately not typical of any extensive areas in Malaya, is, however, such as is not infrequently occupied by Chinese squatters who mainly grow sweet potatoes and the like as food for pigs.

In the present instance, the land had proved absolutely infertile for rapidly-growing food or cover crops, although previously, after efficient drainage, it had supported crops of tapioca and derris and fibre plants.

The results of the present series of experiments shew that on such soil the application of artificial fertilizers produces no economic improvement in fertility, but that farmyard manure makes the production of short-term food crops possible, although even in such cases, yields are of a low order.

The substitution of green organic dressings for farmyard manure suggested itself in view of the difficulty of obtaining the latter in large quantities. Experiment proved, however, that such green dressings could not be relied on to give results equal to those given by farmyard manure, even with the addition of artificial fertilizers.

Malayan Rubber Statistics.

The review of statistics concerning the areas and production of rubber in Malaya in 1933, which will be found in this issue, is designed to present in concise form the position of the industry at the end of 1933. Accuracy on such a subject is an impossibility—the most that can be expected is an approximation to the truth. It is an undoubted fact, however, that the annual statistics have shewn constant improvement, especially in respect of an extension of the information obtained. For this result, the organisation of the Statistics Department and the liaison between the Departments of Agriculture and Statistics, are responsible, but one must also acknowledge the assistance of owners and managers of estates for the more prompt presentation of their returns.

The advent of the scheme of Rubber Regulation introduces a new phase in the compilation of statistics. The new organisation will be in possession of more complete data from individual estates and small holdings than has hitherto been available. The close collaboration of the Statistics Department with the work of the Controller of Rubber has suggested itself and it is hoped as a result, that more complete statistics than have hitherto been possible, respecting the year 1934, will become available early in 1935.

**Rubber Control in
the Netherlands
Indies.**

An important abstract has been taken from this number at the last moment to make room for an abstract of the Nineteenth Report on Native Rubber Cultivation in the Netherlands Indies. In view of the introduction of control of rubber, and of the importance in this connexion of the position of rubber production in the Netherlands Indies, this authoritative report is of great interest. The full report, in English, will be found in the *Economic Bulletin of Netherlands India* published September 17, 1934.

One of the most significant results of the method adopted in the Netherlands Indies for the control of rubber exports is a decided improvement in methods of preparation of the product. This improvement may be to the disadvantage of certain interests, but it cannot be denied that it is to the advantage of the country of production and of the rubber industry as a whole. Hitherto, the native rubber from the Netherlands Indies has been vastly inferior to that produced on small holdings in Malaya. It is to be expected that although the recent improvements were dictated by the conditions arising as a result of restriction, they will prove to be of a permanent nature. In the meantime, the quality of rubber produced by small-holders in Malaya shews still further improvements—the result, very largely, of propaganda.

These developments must be welcome to the administrations of the countries concerned, for not only is it of advantage to the rubber industry as a whole that a high product should be marketed, but it is reflected in the well-being of the small producer, who receives an enhanced price for his product.

Original Articles.

STUDIES IN MALAYAN SOILS.*

Part IV. Experiments on the Conditioning of an Infertile Soil.

BY
J. LAMBOURNE,
Assistant Agriculturist.

In Part II (*Malayan Agricultural Journal* Vol. XXI, October 1933, p. 471) of the Series, a description was given of small-scale pot and field experiments on a dark coloured quartzite valley soil which showed specific effects from the application of cattle manure. This manure, even in small applications which supplied nutrients in amount equal to those contained in normal dressings of artificial fertilizers, gave results markedly better than artificials. The soil on which these experiments were conducted was representative of a not inconsiderable area of flat land at the Central Experiment Station, Serdang, which in the past has been unsatisfactory with short-term food crops. Certain parts of the area exhibit the undesirable characters mentioned by Dennett (*Malayan Agricultural Journal*, Vol. XXI, p. 356) as likely to be found in valley soils of quartzite formation, *viz.* occurrence of free carbon and of sulphur-rich shales: others have shallow soil overlying a deep subsoil of exceedingly fine, closely packed sand, but considerable portions exhibit no obviously undesirable characters. The physical analysis of the soil is good, indicating clay or sandy loams and in chemical composition the soil is up to the average of quartzite hill soils.

Table I.
Analysis of Soil from Block 30, Serdang.

CHEMICAL		MECHANICAL	
	Per cent.		Per cent.
Moisture	5.2	Gravel	nil
Loss on ignition	7.5	Coarse sand	17.0
Carbon	1.53	Fine sand	29.0
Nitrogen	0.087	Silt	10.0
Lime	0.054	Clay	44.0
Iron and aluminium oxides	17.4	pH value	5.0
Potash (K_2O)	0.256		
Phosphoric acid (as P_2O_5)	0.027		
Magnesia	0.051		

* Parts I, II and III of this article appeared in *The Malayan Agricultural Journal*, Vol. XXI, Nos. 8 and 10 and Vol. XXII, No. 1 respectively.

When this part of the Plantation was opened up in 1923 the low-lying area was under light jungle and was swampy in wet weather, water up to three feet being encountered. It was noticed that the light jungle was of a peculiar nature containing many trees with stilt roots. No large trees were encountered, but as this is a mining district large timber of value may have been previously removed. The area might be described as supporting a swamp flora and many species were noted as occurring in similar situations elsewhere. Efficient drainage was provided at an early date.

Early cropping of the central part of the area with which we are here concerned gave no indication of infertility, but such planting was of fibre crops, derris, and tapioca and not of crops such as maize, tobacco and leguminous covers. It is not to be anticipated that one or two crops of fibre or derris could exhaust soil so completely as to inhibit growth, and evidence to the contrary is provided by tapioca which exhibited only a normal falling off of yield from 1924 to 1929. It is to be emphasised that when maize and similar crops are planted there is not merely poor growth, but practically complete absence of growth.

A number of field experiments have been carried out on this area since 1931, which may conveniently be grouped under four heads, *viz.*—

- A. Manurial trials with maize and tobacco.
- B. Green organic dressings experiment.
- C. Green organic dressings experiment plus artificial fertilizer.
- D. Soil reconditioning experiments with farmyard manure, lime, artificial fertilizers and green dressings.

Of these, A and D were suggested and the lay-out planned by the Director of Agriculture (Dr. H. A. Tempany, C.B.E.), while B and C were planned by the Chief Research Officer (Mr. W. N. C. Belgrave). Actual field supervision and reporting were carried out by Messrs. J. N. Milsum and J. L. Greig for the first year of series A and D. The remainder of the work was carried out by the writer.

Series A. Block 24. Manurial trials with Tobacco and Maize.

History of the Block.—After clean clearing in 1923 the land was tractor-cultivated and planted with Caraguata fibre which remained until 1928. Growth was good; no manure was applied. Tapioca was planted after ploughing in December 1928, and yields were below normal. This crop was removed in December 1929, the land remaining fallow and bare for ten months. Maize preceded by a dressing of 40 lbs. urea per acre was then planted, but failed completely.

Experiment I. Plots of 1/16th. acre were laid out to give four replications each of three treatments and a control; eight of the plots were planted with maize and eight with tobacco in April, 1931.

Controls	Received no manure.
N.P.K.*	= Nitrogen, phosphate, and potash.
F.Y.M. + N.P.K.	= Farmyard manure plus nitrogen, phosphate and potash.
F.Y.M.	= Farmyard manure.

The farmyard manure was applied at the rate of 20 tons per acre and the complete mixture (N.P.K.) was made up as follows:—

Sulphate of ammonia 20 per cent. N.	...	300 lbs. per acre.
Superphosphate 18/20 per cent. P_2O_5	...	200 "
Sulphate of potash 48 per cent. K_2O	...	100 "

The whole of the farmyard manure and half the artificials were applied before planting and the other half of the latter, three weeks after planting.

The maize germinated evenly over the plots and the tobacco plants appeared well established. After two months the plants to which F.Y.M. had been applied both with and without artificials had produced good growth of both maize and tobacco; those to which artificials only had been applied showed poor growth and no crop was obtained from either maize or tobacco, and in the case of the control the plants turned yellow and died when a few inches high.

Plates I and II show the appearance of the maize plots seven weeks after planting.

Table II.
Yield of Maize and Tobacco Leaf in 1931. Calculated to lbs.
per acre on the Means of two Plots.

Treatment	Maize lbs.	Tobacco Green Leaf lbs.
Control ...	—	—
N.P.K. ...	—	—
F.Y.M. with N.P.K. ...	485	3,686
F.Y.M. ...	428	3,370

Experiment II.—To ascertain whether any residual effect existed from the previous application of manures, the experiment was repeated on the same plots in April, 1932, after about eight months fallow. Each of the plots mentioned above was divided into two, one half in each case receiving similar treatment

* For the sake of brevity the initials N.P.K. are used throughout the article for Nitrogen, Phosphate and Potash, and F.Y.M. for Farmyard Manure.

to that previously given, with the difference that nitrogen and phosphoric acid were applied as calcium cyanamide and basic slag while the other half received no further treatment beyond cultivation. The change in form of the manure was due to information gained in the course of work by the Soils Division and described in Part II of this Series.

The actual mixture of artificials applied in this case was as follows:—

Calcium cyanamide	...	200 lbs. per acre.
Basic slag	...	225 "
Sulphate of potash	...	100 "

The whole of the farmyard manure and half the artificials were applied before planting and the other half of the latter, three weeks after planting.

Table III.

Yield of Maize and Tobacco Leaf in 1931. Calculated to lbs.
per acre on the Means of two Sub-plots.

Treatments		Yield of Maize lbs.	Yield of Green Tobacco Leaf lbs.
Residues 1931 manures.			
Controls	...	4	—
Artificials only	...	44	176
Artificials + Farmyard Manure	...	704	1,984
Farmyard Manure	...	768	2,032
Residues from 1931 + Manures 1932.			
Control	...	8	—
Artificials only	...	208	2,400
Farmyard Manure + Artificials	...	1,472	4,848
Farmyard Manure	...	1,600	3,920

Discussion of Results.—From Table II it will be seen that on this type of soil after some years cropping, neither maize nor tobacco can be grown even with the addition of a complete mixture of artificial fertilizer. On the other hand, dressings of farmyard manure enable reasonable crops to be obtained which are not greatly increased by addition of artificials to the farmyard manure.

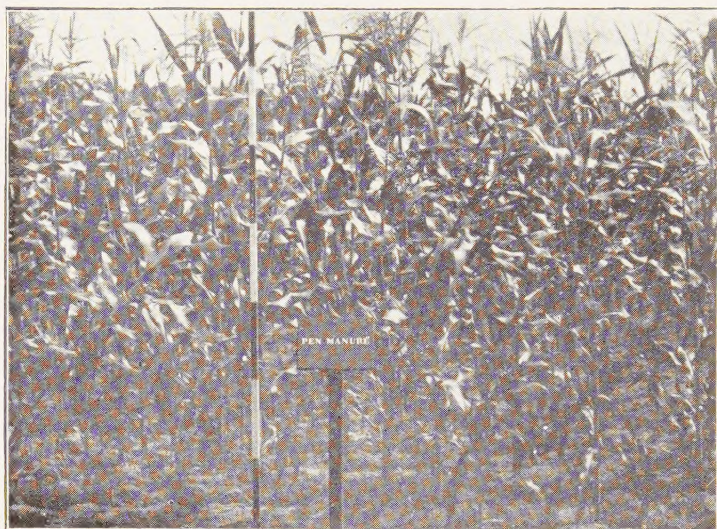


MAIZE. CONTROL PLOT.



MAIZE. ARTIFICIAL MANURE PLOT.

PLATE II.



MAIZE. F. Y. M. PLOT.



MAIZE. F.Y.M. AND ARTIFICIALS PLOT.

It must, of course, be borne in mind that the actual quantities of nutrients added are not comparable; the artificial mixture used supplied approximately 60 lbs. nitrogen, 38 lbs. phosphoric acid (as P_2O_5) and 48 lbs. potash (as K_2O) while the farmyard manure supplied approximately 270 lbs. nitrogen, 450 lbs. phosphoric acid and 135 lbs. potash of which, under tropical conditions, a large part may be expected to be readily available.

Table III shows that there was considerable residual effect from farmyard manure and that the use of "basic" artificials resulted in the production of a fair crop of tobacco and some growth of maize. In Part II of the Series it has been shown that better results from "basic" manures are not peculiar to these valley soils, but extend to quartzite hill soils as well.

Series B. Green Organic Dressings Experiments.

The main conclusion arrived at as the result of the previous experiment is of limited practical application in Malaya, as in the majority of cases sufficient supplies of farmyard manure are unobtainable. It is possible that in certain States, notably Kedah and Kelantan where cattle rearing is more extensively practised, a solution might be found by organising the production of cattle manure on lines practised, for example, in Mauritius and some of the West Indian Islands, but in the generality of cases this is not feasible.

Accordingly, a further series of experiments was undertaken in order to ascertain to what extent the incorporation of organic matter in the soil could be successfully substituted for the use of farmyard manure in the process of soil rejuvenation.

Soil.—The area used for this experiment is in a ten acre block contiguous to that on which the manurial experiment described above was carried out. The soil on the whole is heavier, having from 50 to 60 per cent. fine fractions, and may be described as a dark clay loam.

History of the Block.—The history of the block is approximately similar to that on which the A series of experiments was carried out. It was opened at the same time, and was first planted in 1924 with sisal hemp, *Agave rigida* var. *sisalana*. By 1930 it had become unproductive and lay fallow from September, 1930 until December, 1931; in the latter month it was ploughed and then allowed to remain fallow again until April, 1932, when a cover crop (*Mikania scandens*) was planted with a small dressing of basic slag. This crop took root, but made very little growth and the area remained fallow, covered mainly with a poor growth of grass until the experiment to be described below was laid out.

Lay-out of the Experiment.

The area employed in this experiment comprises two acres divided into forty 1/20th. acre plots arranged in four blocks A—D of ten plots each; the following treatments were randomised in each series:—

Treatment

- | | | |
|-----|-----|---|
| No. | 1. | <i>Centrosema pubescens</i> dug in green six weeks before planting. |
| | 2. | <i>Centrosema</i> dug in green three weeks before planting. |
| | 3. | <i>Centrosema</i> dug in green one week before planting. |
| | 4. | Cut grass dug in green six weeks before planting. |
| | 5. | Cut grass dug in green three weeks before planting. |
| | 6. | Cut grass dug in green one week before planting. |
| | 7. | <i>Centrosema</i> laid on surface five weeks and dug in one week before planting. |
| | 8. | <i>Centrosema</i> laid on surface two weeks and dug in one week before planting. |
| | 9. | Cut grass laid on surface five weeks and dug in one week before planting. |
| | 10. | Cut grass laid on surface two weeks and dug in one week before planting. |

The different treatments were designed to test points which had arisen in the course of pot culture work described in Part II and III of this Series.

The *Centrosema pubescens* was obtained from other parts of the Station, and the cut grass from road sides. These green materials were applied to the plots at the rate of fifteen tons per acre.

Maize (var. Native Flint) was grown in the plots, the seeds being planted two per hole (21 lbs. per acre) at a distance of 15 inches in rows two feet apart.

The seeds germinated evenly, but subsequent growth was uneven and the majority of the plants turned yellow at the edges of the leaves; there were patches, however, in most of the plots where the seedlings grew normally. Wet weather was prevalent during the early growth of the plants and this may have affected them adversely, although drainage was good.

To save the plants from dying, it was decided to give a dressing of artificial manures to all the plots. The following mixture was applied between the rows and raked into the soil four weeks after planting: calcium cyanamide 1 cwt., basic slag 3 cwts., and sulphate of potash $\frac{3}{4}$ cwt. per acre.

The effect of the fertilizers was apparent in about a fortnight after their application, by which time the plants had a more healthy colour and commenced to grow with more vigour, although growth remained uneven in all the plots up to the time of harvest at the end of January, 1933.

The yields of maize are given in Table IV and will be discussed later.

Table IV.
Calculated Yields per acre Clean Maize.
Plots 1/20th acre.

Treatment	Block A.	Block B.	Block C.	Block D.	Means
	lbs.	lbs.	lbs.	lbs.	lbs.
1	165	120	480	220	246
2	235	300	440	80	264
3	360	440	360	320	370
4	40	520	560	520	410
5	240	420	200	120	245
6	340	540	480	510	468
7	760	420	360	200	435
8	160	500	480	540	420
9	300	80	80	620	270
10	260	320	80	260	230
Means	286	366	352	339	336 General Mean

The proportion of trash to maize was of the same order throughout.

The plots used in this experiment were subsequently ploughed in April, 1933, to turn in the grasses and weeds that had appeared in the plots after the maize was harvested. A dressing of basic slag at the rate of 2 cwts. per acre was applied to all the plots, and cow peas were planted on the 11th May, 1933, the sowing being at the rate of 21 lbs. per acre. The seeds germinated in a few days and grew fairly evenly on all the plots. Aphis attacked the plants when they were about 6 inches in height, but were controlled by spraying with kerosene emulsion. Two months after planting, the cow peas had made excellent growth on all the plots, irrespective of earlier treatment, but the crop of seeds was poor owing to the fact that a disease developed in the pods before they were ripe and caused considerable damage; rats were also troublesome. The yields of cow pea seeds are given in Table V, and from these figures it will be seen that there is considerable variation in yield of seeds from the different plots. The difference between the lowest-yielding plots: Centrosema dug in three weeks before planting, and the highest: cut grass laid on the surface five weeks and dug in one week before planting, is however, not significant because, on statistical examination, it has been found that a difference in yield of 114 lbs. of seed per acre between any two plots is required for significance.

Table V.
Calculated Yields per Acre. Each plot—1/20th. acre.
Cow Pea.

Treatment	Block A.	Block B.	Block C.	Block D.	Means
	lbs.	lbs.	lbs.	lbs.	lbs.
1	225	129	63	43	123
2	190	100	23	45	90
3	323	189	43	1	139
4	143	118	43	81	96
5	383	70	63	23	135
6	351	230	67	41	172
7	280	107	163	5	139
8	141	150	33	183	127
9	414	200	41	43	175
10	207	121	120	107	139
Means	269	141	66	57	134 General Mean

Difference between treatments required for significance = 114 lbs. per acre.

Discussion of Results.

The maize crop results were analysed by the Chief Research Officer and his comments are as follows:—

“Application of statistical method is scarcely fair in this experiment since growth was excessively uneven in any one plot. However, for what it is worth analysis gives a significant “Z” value and standard deviation of 115 lbs., roughly 30 per cent. of the mean, from which it follows that the smallest significant difference between any pair is 200 lbs.”

“The average yields of maize from the different treatments arranged in order of merit are as follows:—

Treatment	lbs. per acre.
No. 6. Grass dug in green one week before planting ...	468
7. <i>Centrosema pubescens</i> laid down on the surface five weeks and dug in one week before planting	435
8. <i>Centrosema pubescens</i> laid on the surface two weeks and dug in one week before planting ...	420
4. Grass dug in green six weeks before planting ...	410
3. <i>Centrosema pubescens</i> dug in one week before planting ...	345

2.	<i>Centrosema pubescens</i> dug in three weeks before planting	...	264
1.	<i>Centrosema pubescens</i> dug in six weeks before planting	...	246
5.	Grass dug in three weeks before planting	...	245
10.	Grass laid on the surface two weeks and dug in one week before planting	...	230
9.	Grass laid on the surface five weeks and dug in one week before planting	...	220

"All that can be said with any degree of assurance is that the first five treatments, 3, 4, 6, 7 and 8 appear definitely better than the other five. The exclusion of the worst plot in each case does not appreciably alter the order of merit".

"Apart from the apparently aberrant case of No. 5, grass buried for three weeks before planting, it would appear that grass laid on the surface is useless, while *Centrosema* benefits by that treatment; further, *Centrosema* is useless if buried too long before planting. These apparently conflicting facts may be connected with the difference in nitrogen content, *Centrosema* containing approximately three times more nitrogen than does grass".

"The experiment was further complicated by the necessity for a top dressing of complete fertilizers to save the plants".

The yield of cow pea seeds was poor, but the growth of the crop was excellent.

Series C. Green Organic Dressings Experiment, plus Artificial Fertilizers.

This experiment follows as a natural sequence to the one described above and supplements it essentially by the application of different mixtures of artificial manures before sowing.

Soil.—The soil is a fairly even clay with 50 to 60 per cent. fine fractions.

History of the Area.—After being cleared of jungle in 1923 the area was cultivated with a tractor-plough. Tapioca was planted in November, 1924, and harvested in April, 1926. Horse gram, *Dolichos biflorus* was sown immediately afterwards on half the area; the other half received no treatment beyond the same cultivation. The horse gram was turned in during December, 1926, and a second crop of tapioca planted. This treatment was repeated and a third crop of tapioca planted which was harvested in 1929. Thereafter until April, 1933, the land lay fallow when the present experiment was laid out.

Lay-out of Experiment.

The area was divided into sixteen plots of one-tenth acre each arranged in a Latin Square. The treatments were as follows:—

- A. *Centrosema pubescens* turned in green six weeks before planting.
- B. *Centrosema pubescens* turned in green one week before planting.
- C. *Centrosema pubescens* laid on the surface for five weeks and turned in one week before planting.

D. Grass cuttings turned in green one week before planting.

These green dressings were applied at the rate of 15 tons per acre commencing on the 18th April, 1933.

Each of the plots to which green dressings had been applied was divided into four sub-plots of 1/40th. acre and received supplementary dressings of artificials treated as follows:—

1. Phosphorus as basic slag: 2 cwts. per acre.
2. Basic slag as in 1 + N as calcium cyanide: 1 cwt. per acre.
3. Basic slag as in 1 + potash as sulphate: $\frac{1}{2}$ cwt. per acre.
4. Phosphorus and nitrogen as in 2 + potash as sulphate: $\frac{1}{2}$ cwt. per acre.

Treatments were randomised and the artificial manures were applied one week before sowing gingelly. The seeds were sown on the 2nd and 5th June, 1933, in rows eighteen inches apart.

Owing to drought, growth was uneven and subsequently the plants were attacked with disease.

Discussion of Results.

The mean yields of gingelly seeds are given in Table VI. These figures have been examined statistically and differences found to be without significance. A difference of 80 lbs. per acre would be required in sub-plot means and this does not occur. These results do not confirm those of series B, but dry weather conditions, or the fact that the crop was different, may be responsible.

Table VI.
Organic Dressings Experiment with Manures.
Calculated Yields per acre of Gingelly Seeds.
Means of four Sub-plots.

Plot Nos.	1 P. lbs.	2 N.P. lbs.	3 P.K. lbs.	4 N.P.K. lbs.	Means lbs.
A	167.5	192.5	175.0	197.5	183
B	170.0	215.0	127.5	205.0	179
C	162.5	160.0	152.5	170.0	161
D	97.5	135.0	122.5	142.5	124
Means	149.4	175.6	144.4	178.7	162 General Mean

Series D. Soil Reconditioning Experiments, Farmyard Manure, Lime, Artificial Fertilizers and Green Dressings.

This was an exploratory experiment designed to obtain some indication of the interaction of artificial fertilizers, lime, farmyard manure, and green organic dressings.

Soils.—The soil varies from a clay loam to a sandy clay loam with 40 to 60 per cent. fine fractions.

History of the Block.—The land was first opened in 1923 and after ploughing, various species of derris were grown until April, 1929. In May, 1929, the area was sown with *Tephrosia toxicaria*, which failed, apparently owing to the poor soil conditions. The land then lay fallow until the present experiment was laid down in April, 1931.

The area under experiment was five acres, divided into four plots of equal size and treated as follows:—

- A — No treatment (Control).
- B — Lime 2 tons per acre.
- C — Lime as in B + farmyard manure 20 tons per acre.
- D — Farmyard manure 20 tons per acre.

Each of the above plots was divided into five sub-plots and the following artificial fertilizers were applied:—

- Sub-plot 1 Control (No further treatment).
- 2 N.P. (Nitrogen and phosphate).
- 3. N. (Nitrogen).
- 4. N.K. (Nitrogen and potash).
- 5. N.P.K. (Nitrogen, phosphate and potash).

When the experiment was laid out the advantage of using basic manure had not yet been realised.

Lime was applied early in May and the farmyard manure about a fortnight later. The artificial fertilizers were applied at the beginning of June. The whole of the five acres was then divided into three strips across the above treatments and the strips were sown with *Crotalaria anagyroides*, *Centrosema pubescens*, and *Crotalaria usaramoensis*, respectively.

The *Crotalaria* spp. were pruned periodically as they commenced to flower and the prunings were laid on the surface *in situ*. The *Centrosema pubescens* was allowed to grow and cover the soil. *Crotalaria anagyroides* died out after the first pruning in October, 1931, and was resown during November of that year. These leguminous crops were allowed to remain for a period of about fifteen months at the end of which time they were turned into the soil.

Table VII.

Calculated Yields per acre of Green Material Produced by the
Leguminous Crops (irrespective of artificial manures).
Means of five Sub-plots.

Treatment	<i>C. anagyroides</i>	<i>C. usara moensis</i>	<i>C. pubescens</i>	Means.
	lbs.	lbs.	lbs.	lbs.
A. Control	10,231	13,036	2,396	8,554
B. Lime	11,971	10,288	12,995	11,751
C. Lime + F.Y.M.	61,788	44,018	42,203	49,336
D. F.Y.M.	64,269	46,443	31,799	47,504
Means of all plots	37,065	28,446	22,348	29,286 General Mean

Table VIII.

Calculated Yields per acre of Green Material from the Leguminous Crops
for the Different Artificial Manures.
Means of three Sub-plots.

Treatment	1 Control	2 N.P.	3 N.	4 N.K.	5 N.P.K.	Means
	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
A. Control	10,299	10,109	5,651	6,579	10,133	8,554
B. Lime	9,227	9,631	8,549	12,094	19,255	11,751
C. L + F.Y.M.	42,348	46,250	52,207	51,530	54,347	49,336
D. F.Y.M.	52,171	49,466	47,496	42,810	45,575	47,504
Means of all plots	28,511	28,864	28,476	28,256	32,328	29,286 General Mean

Table IX.

Calculated Yields per acre of Green Material from the Leguminous Crops
Turned-in immediately before Sowing Gingelly.
Means of five Sub-plots.

Treatment	<i>C. anagyroides</i>	<i>C. usaramoensis</i>	<i>C. pubescens</i>	Means
	lbs.	lbs.	lbs.	lbs.
A. Control	1,618	557	2,396	1,524
B. Lime	1,049	403	12,995	4,816
C. Lime + F.Y.M.	2,268	1,882	42,203	15,451
D. F.Y.M.	1,999	1,563	31,799	11,787
Means of all plots	1,733	1,101	22,348	8,394 General Mean

Table VIII shows the green material obtained over the 15 months period and in the case of *Crotalaria* spp. includes all prunings. The weight of *Centrosema pubescens* was obtained by calculation from the mean of ten samples taken from each sub-plot. Table IX shows the actual amount of green material turned in immediately before sowing.

Subsequent to turning in the green matter at the beginning of October, 1932, the whole area was given a dressing of basic slag at the rate of one cwt. per acre. Gingelly was sown towards the end of October, 1932, at the rate of five lbs. per acre. Unfortunately germination was uneven and the area was resown during the first week in November. The weather was exceptionally wet after resowing, but subsequent germination was even.

It was early apparent that the gingelly seedlings were stronger on the plots to which farmyard manure was applied in 1931. It must be pointed out that owing to the effect of the farmyard manure, larger amounts of green material had been turned in on such plots. The plots which were treated with lime in addition to farmyard manure produced more vigorous plants than the unlimed farmyard manure plots. This was particularly noticeable in the *Centrosema pubescens* plots. On the plots which received no farmyard manure growth was slow, but was better on the limed plots than on the controls.

The gingelly crop was harvested during the first week in February, 1933, three months after sowing, and the yields are given in Tables X and XI.

Table X.
Calculated Yields per acre of Gingelly Seeds and Trash.
Means of five Sub-plots.

Treatment	<i>Crotalaria anagyroides</i>		<i>Centrosema usaramoensis</i>		<i>Crotalaria pubescens</i>		Means	Means
	Stems and Trash	Clean Seed	Stems and Trash	Clean Seed	Stems and Trash	Clean Seed	Trash	Seed
	lbs. p. acre.	lbs. p. acre.	lbs. p. acre.	lbs. p. acre.	lbs. p. acre.	lbs. p. acre.	lbs. p. acre.	lbs. p. acre.
A. Control	490	127	540	98	370	84	467	103
B. Lime	814	214	956	307	998	329	923	283
C. L + F.Y.M.	2,415	564	1,543	624	3,482	814	2,480	667
D. F.Y.M.	1,159	206	758	206	943	175	954	196
Means of all plots	1,219	279	949	309	1,447	351	1,206	312

Table XI.
Calculated Yields per acre Gingelly Seed.
Means of three Sub-plots.

Treatment	1 Control	2 N.P.	3 N.	4 N.K.	5 N.P.K.	Means
	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
A. Control	96	76	68	92	184	103
B. Lime	296	272	252	224	372	283
C. L + N.P.K.	640	624	652	708	712	667
D. F.Y.M.	252	204	168	164	192	196
Means of all plots	321	294	285	300	365	312

After harvesting, the land was again ploughed and basic slag at the rate of two cwts. per acre was applied subsequent to the planting of groundnuts. The soil was drawn up into ridges eighteen inches apart and the seeds sown at one foot apart on the ridges at the rate of 80 lbs. of unshelled nuts per acre. Germination was even over the whole area.

Growth was good on the plots that were originally supplied with farmyard manure, the lime plus farmyard manure plot being slightly better in appearance than the unlimed farmyard manure plots. The limed, and also the control plots, were poor in comparison, but the former were slightly better in appearance than the latter.

A number of plants died from the effects of what appeared to be slime disease, but the area was not badly affected. Rats were troublesome just before the crop ripened and considerable damage was done, more especially to the farmyard manure plots (A) and (B) where the foliage was thick and afforded cover for this pest. Poisoned baits were laid down in large quantities and although most of these disappeared, the rats remained troublesome until harvest, which took place at the end of July and beginning of August, 1933.

Table XII.
Calculated Yields per acre of Unshelled Groundnuts.
Means of five Sub-plots.

Treatment	<i>C. anagyroides</i>	<i>C. pubescens</i>	<i>C. usaramoensis</i>	Means
	lbs.	lbs.	lbs.	lbs.
A. Control	127	42	40	70
B. Lime	95	63	42	67
C. L + N.P.K.	521	368	314	401
D. F.Y.M.	394	326	292	337
Means of all plots	284	200	172	219

Table XIII.
Calculated Yields per acre of Unshelled Groundnuts.
Means of three Sub-plots.

Treatment	1 Control	2 N.P.	3 N.	4 N.K.	5 N.P.K.	Means
	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
A	74	58	58	62	94	69
B	88	80	52	56	56	66
C	324	440	364	398	477	401
D	334	340	324	376	312	337
Means	205	229	200	226	235	218

Discussion of Results.

The figures in Table VII show that in the case of areas on which the two *Crotalaria* spp. were grown, farmyard manure alone gave slightly better yields of prunings than farmyard manure and lime. *Centrosema pubescens* appears to have derived benefit by the addition of lime and this was shown in the plot with lime alone where the cover was more complete than in the control plot.

The effect of artificial fertilizers has varied between plots, but the means of nitrogen only, nitrogen and phosphate, and nitrogen and potash are the same, while the complete mixture gave yields about 15 per cent. higher. It is doubtful whether the latter is significant.

The highest-yielding plot was that to which farmyard manure plus lime was originally applied and *Centrosema pubescens* turned in, the *Crotalaria usaramoensis* block being second, and *C. anagyroides* third. The means for all plots in the green manure blocks are also in the same order.

When the total weight of green material produced by the leguminous crops (Table VII) is compared with the total weight of the gingelly crop (Table X) there appears to be no correlation between green leguminous material produced and the yields of gingelly.

General Discussion.

With one exception all crops were low, and as Table XIV shows, even successive heavy dressings of cattle manure have failed to raise yields to those normally to be anticipated.

Table XIV.

Normal Crop lbs. per acre.	Series A.		Series B.		Series D.	Series C.
	(i)	(ii)	(i)	(ii)		
Maize 2000-2500	485 (max)	1600 (max)	468 (max) 336 (mean)			
Tobacco 7000-11000	3700 (max)	4800 (max)				
Gingelly 600					162 (mean)	312 (mean) 667 (max)
Cow pea 500				134		
Groundnut 1000-1300						401 (max) 219 (mean)

It is clear however that by treatment with cattle manure or by a combination of phosphatic manure and green manuring it is possible to obtain crops of some sort on land otherwise absolutely infertile for rapidly-growing food or cover crops.

Of the two treatments, cattle manure is superior in respect of vigour of plant and residual effect. The enhancement of yield found in experiment D as a result of combining lime with cattle manure has been observed in pot experiments with other local soil types. This enhancement is not necessarily obtained with artificials and in some cases decreases as the result of liming have been noted.

In order to test the possibility that owing either to submergence (swamp conditions) in the recent past, or the fact that fallowing of dark-coloured soil might result in undue heating and partial sterilisation of the soil flora, pot culture experiments were carried out with gingelly and maize in which (*a*) very small quantities of cattle manure and (*b*) large dressings of the same manure sterilised by heating were applied. In the result (*a*) gave poor or no growth and (*b*) excellent growth, from which it follows that the bacteria carried by the manure do not play a part in its specific and marked effect.

Confirmation of the fact that the soil was not sterile was obtained by observations on nitrification.

The problem of this soil, like almost all dealing with the vexed question of fertility, must await further work for its solution.

Fortunately, areas of quartzite valley soil are not extensive, but such as exist are not infrequently occupied by Chinese squatters who mainly grow sweet potatoes and the like as green food for pigs. These crops are heavily manured with pig manure and it is clear that considerable caution should be exercised in interfering with this practice.

REVIEW OF MALAYAN RUBBER PLANTING STATISTICS

BY

D. H. GRIST,

Deputy Registrar-General of Statistics.

The following review treats of the rubber-planting industry in the Federated Malay States and Straits Settlements in detail, statistics for these areas being complete to the end of 1933. Similar data are not available for certain of the Unfederated Malay States, and in such cases it has been necessary to make use of the 1932 statistics. The publication of these statistics—although incomplete as far as certain States are concerned—is justified in view of the introduction of rubber regulation.

The information concerning estates of 100 acres and over has been compiled from the replies to a questionnaire submitted to each estate at the end of 1933, and from monthly statistics collected from each estate of 100 acres and over.

Data concerning holdings of under 100 acres are less complete, owing to the very large number of such properties, to the stage of literacy of the majority of the owners and to their diverse nationalities. Collection of anything approaching accurate statistics from small holdings would necessitate individual inspection, work which at present is quite beyond the resources of the Statistical Department. It should be possible in the present year to revise the data by collaboration with those responsible for the working of the new scheme for rubber regulation. The present statistics of areas of small holdings are based on data obtained during the application of the Stevenson Restriction Scheme, areas planted subsequently being reported to the Department by the Government Administrative Branch.

The information here given is grouped under four sections (i) Areas, (ii) Production, (iii) Prices, (iv) Labour.

(i) Areas.

Area Planted with Rubber.

The following table states the present position, as far as is known, regarding the distribution of rubber areas in Malaya. The differentiation of “tappable” and “young rubber” in the case of estates of 100 acres and over is compiled from statements made by individual estates. In the case of small holdings, young rubber is taken to be rubber plants planted in the year 1925, or in any subsequent year. This basis conforms with the Federated Malay States Enactment to regulate the production and export of rubber.

Table 1.
Total Area in Malaya planted with Rubber Trees: end of 1933.

State or Territory	Estates of 100 acres and over		Estates of under 100 acres		Total Planted Area
	Tappable.	Young rubber.	Tappable.	Young rubber.	
	acres	acres	acres	acres	acres
Perak ...	253,227	20,793	221,556	30,192	525,768
Selangor ...	310,003	32,475	138,833	16,687	497,998
Negri Sembilan ...	233,592	40,607	66,880	15,279	356,358
Pahang ...	46,712	20,178	57,829	18,435	143,154
Total F.M.S. ...	843,534	114,053	485,098	80,593	1,523,278
Dindings ...	7,368	360	7,279	388	15,395
Malacca ...	121,152	5,739	67,898	7,015	201,804
Penang Island ...	1,366	261	9,505	1,707	12,839
Province Wellesley ...	44,285	783	16,052	3,774	64,894
Singapore ...	28,842	1,511	12,469	312	43,134
Total S.S. ...	203,013	8,654	113,203	13,196	338,066
			Total area estates of under 100 acres at end 1932.		
Johore* ...	325,747	132,217	396,725		854,689
Kedah* ...	114,551	80,157	106,460		301,168
Kelantan ...	25,793	6,688	58,789		91,270†
Trengganu ...	4,543	274	20 000		24,817
Perlis ...	1,181	339	3,687		5,207†
Total U.M.S. ...	471,815	219,675	585,661		1,277,151†
TOTAL MALAYA ...	1,518,362	342,382	1,277,751		3,138,495†

* Complete returns in respect of the year 1933 have not yet come to hand. The figures here given are therefore those of 1932. For estates of under 100 acres in the Unfederated Malay States, 1932 figures are here given in the absence of returns for the year 1933.

† These figure may disagree slightly with those published in the *Rubber Statistics Handbook, 1934*.

From the above, it will be seen that of the total area planted with rubber trees in Malaya, nearly 41 per cent. is contained on estates of under 100 acres each.

It is estimated, but there is no direct statistical evidence to support the statement, that the area of rubber on estates of between 25 and 100 acres is over 300,000 acres or about 10 per cent. of the total area. These figures are important because field observations indicate that the quality of tapping on such holdings is equal to that in the larger estates.

Newly Planted Areas.

The total area of rubber in the Federated Malay States and Straits Settlements as shewn above exceeds the previous year's return by 12,353 acres. Part of this increase is due to areas which have been recorded for the first time. On estates of 100 acres and over, 4,187 acres in the Federated Malay States and 374 acres in the Straits Settlements were planted during the year, and the area abandoned or destroyed during this period was 1,755 and 267 acres respectively. On small holdings, 2,092 acres were planted in the Federated Malay States and 1 acre in the Straits Settlements.

Reserve Land.

In view of the condition laid down in respect of rubber regulation that no new areas shall be planted with rubber, it is of interest to note that the area of reserve land held by the estates of 100 acres and over at the end of 1933 was 171,201 in the Federated Malay States and 21,099 acres in the Straits Settlements of which, however, 11,444 acres are known to be swamps, building sites or land otherwise unsuitable for rubber planting. Similar figures for the Unfederated Malay States are not available, but those of 1932 were 196,618 acres. The reserve land held by estates in Malaya is therefore about 14 per cent. of the area already planted.

Number and Size of Estates.

There is a total of 2,332 estates of 100 acres and over in Malaya. The distribution is shewn in Table 2.

Table 2.
Number and Size of Estates of 100 acres and over.

Size of Estates	Federated Malay States		Straits Settlements		Unfederated* Malay States		Total*	
	No. of estates	Total acres	No. of estates	Total acres	No. of estates	Total acres	No. of estates	Total acres
Over 5000 acres	14	104,372	5	34,689	1	7,943	20	147,004
Between 1000—5000	302	552,797	49	106,966	10	19,201	360	678,964
" 500—1000	235	169,199	42	28,840	7	5,444	284	203,483
" 100—500	594	131,219	193	41,172	29	6,230	816	178,621
Total	1,145	957,587	289	211,667	47*	38,818*	1,480*	1,208,072 ¹

* Excluding Johore and Kedah for which States no figures are available.

Nationality of Ownership.

With very few exceptions, areas of under 100 acres each are Asiatic-owned. The most recent returns concerning estates of over 100 acres each are shewn in Table 3.

Table 3.

Nationality of Ownership of Estates of 100 acres and over.

Nationality of Ownership	Federated Malay States		Straits Settlements		Unfederated Malay States		Total	
	No. of estates	Total acres	No. of estates	Total acres	No. of estates	Total acres	Total acres	No. of estates
European	666	813,011	83	142,541	227	438,485	976	1,394,037
Chinese	311	100,582	154	54,094	519	202,266	984	356,942
Indian	134	30,366	41	11,008	92	21,695	267	63,069
Others	34	13,628	11	4,024	60	59,188	105	76,840
Total	1,145	957,587	289	211,667	898	721,634*	2,332	1,890,888*

Thus it is seen that in Malaya, with a total of 3,168,639† acres under rubber, 1,774,602 acres or 56 per cent. are owned by Asiatics.

Constitution of Estates.

It has been somewhat difficult to determine in some cases whether particular limited liability companies are non-Asiatic or Asiatic-owned. In some cases it has been possible to determine this point by personal knowledge, in other cases the nationality of the majority of directors has been the deciding factor and again in other cases it was decided by the country in which the company is incorporated. It will be realised therefore, that many cases of uncertainty remain, but such doubtful cases cannot materially influence the total. Private owners are those who hold the lease direct from Government. Table 4 summarises the information and demonstrates the enormous preponderance of planted rubber owned by limited liability companies over that owned by private individuals.

* These figures do not agree with those given in Table 1, having been compiled subsequent to the 1932 figures included therein and prior to the end of 1933.

† This figure is based on Table 3 and not on Table 1.

Table 4.
Nationality of Ownership of Estates of 100 acres and over in Malaya.*

Nationality of Ownership	Limited Liability Companies		Private Limited Liability Companies and Privately Owned Estates.		Total	
	No. of estates	Total acres	No. of estates	Total acres	No. of estates	Total acres
European	610	924,493	163	63,913	773	988,406
Chinese	18	14,268	461	143,128	479	157,396
Indian	—	—	178	42,794	178	42,794
Others	10	6,613	40	12,863	50	19,476
Total	638*	945,374*	842*	262,698*	1,480*	1,208,072*

Budgrafted Areas.

The area of budgrafted rubber trees in Malaya has assumed a position of considerable importance during the past two or three years. Of a total planted area in the F.M.S. and S.S. of 93,934 acres, no less than 86,142 acres are owned by non-Asiatics. Total production of rubber from these areas has been small up to the present, for only 6,141 acres were tapped during 1933. The area planted during the year 1933 amounted to 3,476 acres, of which 3,318 acres are in the Federated Malay States. Relative figures cannot be given for the whole of Malaya owing to the absence of complete returns from the States of Johore and Kedah. Table 5 gives a summary of information concerning the distribution of budgrafted areas.

Areas out of Tapping.

The very low price of rubber during the year resulted in a large area of rubber being thrown out of tapping. It is probable—but not an invariable rule—that the areas not tapped were those from which low yields were to be expected. It has also to be remembered that low prices were responsible for the fact that many areas of rubber trees that had reached a tappable size were not opened up.

As the price of the commodity improved during the year the area of tappable rubber trees not tapped decreased. It was very noticeable that small-holders were more adaptable to the varying conditions of the market; an increase in price had an immediate effect on production, while local factors—such as padi planting—exercised an influence on the area tapped in any one period.

In the following table (6) the percentage of rubber untapped is based on the acreage of tappable rubber as at the end of 1932; *viz*: large estates in Malaya

* Excluding Johore and Kedah, for which States no figures are available.

Table 5.
Area of Rubber Trees Budgrafted, end 1933.

State or Territory	Budded rubber at end 1933	Budded rubber planted out during 1933	Tappable area of budded rubber at end 1933	Budded rubber being tapped at end 1933	Budded rubber immature at end 1933
	acres	acres	acres	acres	acres
Perak ...	12,947	1,573	2,963	1,221	9,984
Selangor ...	21,993	464	5,143	2,399	16,850
Negri Sembilan ...	39,043	97	11,289	630	27,754
Pahang ...	15,179	1,184	2,914	1,562	12,265
Total F.M.S. ...	89,162	3,318	22,309	5,812	66,853
Straits Settlements	4,572*	158	1,039	329	3,533
Johore ...	50,463§	not known	5,400‡	not known	45,063‡
Kedah ...	17,667†	„	12,986	„	4,681
Kelantan ...	2,695	—	73	—	2,622
Total U.M.S. ...	70,825	—	18,459	—	52,366
TOTAL MALAYA ...	164,559	—	41,807	—	122,752

1,486,181 acres. The figures for small holdings refer only to the F.M.S. and S.S. and are based on a tappable area of 510,500 acres in the Federated Malay States and 121,000 acres in the Straits Settlements.

The area of tappable rubber untapped on small holdings was estimated by means of counting the number of holdings out of tapping along the sides of main roads; the percentage number of holdings untapped was then applied to the known total area of rubber in each District. For these observations, the holdings on either side of over 700 miles of road are examined quarterly. While it is not claimed that the method will give accurate results, it is evident that it supplies a useful index figure and is an approximation of the actual area out of tapping.

* Of which 3,300 acres are in Malacca, 790 acres in the Dindings and 439 acres are in Province Wellesley.

† Returns from Kedah not yet complete. Figures here given are those reported at end of 1932.

§ Returns from Johore not yet available. Figures here given are those reported at end of 1932.

‡ Estimate.

Table 6.
Areas out of Tapping in Malaya 1933.

Month	Estates of 100 acres and over in Malaya		Holdings of under 100 acres				Average price of Rubber in Singapore cents per lb.
	Acres of tappable rubber not tapped	Percent. of total tappable rubber	Federated Malay States		Straits Settlements		
			Acres of tappable rubber not tapped	Percent. of total tappable rubber	Acres of tappable rubber not tapped	Percent. of total tappable rubber	
January	319,918	21.5	133,000	26	48,600	40	6.76
February	328,034	22.1					6.23
March	326,843	22.0					6.09
April	327,378	22.0	70,000	14	27,700	23	6.94
May	314,664	21.2					9.05
June	306,636	20.2					10.83
July	292,609	19.7	49,000	10	17,600	15	12.65
August	280,029	18.8					12.32
September	273,225	18.4					12.05
October	267,921	18.0	45,000	9	14,000	12	12.84
November	258,587	17.4					13.19
December	247,746	16.7					13.60

For comparison of area out of tapping with the price of rubber, the average monthly price of rubber is shewn in the last column in the above table.

The greater influence of the price of rubber on production from small holdings is also shewn in Table 7.

(ii) Production.

The total production of rubber in Malaya in 1933 amounted to 460,743 tons, of which 220,639 tons, or 47.9 per cent. were from holdings of under 100 each. The detailed monthly production figures are shewn in Table 7.

Production Rate.

The production of rubber on estates of 100 acres and over, based on the area actually tapped, averaged 456 lbs. per acre in the Federated Malay States and 423 lbs. per acre in the Straits Settlements. Corresponding figures for holdings of under 100 acres were 463 lbs. per acre and 546 lbs. respectively. The high figure for production rate on small holdings in the Straits Settlements is

Table 7.
Production of Rubber in Malaya 1933.

Month	Estates 100 acres and over	Holdings under 100 acres	Total
	tons	tons	tons
January	19,716	16,089	35,805
February	18,763	12,786	31,549
March	17,080	14,798	31,878
April	17,202	14,851	32,053
May	19,392	18,346	37,738
June	20,550	18,955	39,505
July	20,293	21,692	41,985
August	21,356	19,672	41,028
September	20,422	19,415	39,837
October	21,423	19,986	41,409
November	21,545	20,299	41,844
December	23,269	21,936	45,205
TOTAL	241,011	218,825	459,836

largely due to the high yield returns for December 1933 which are so high and inexplicable that they must be accepted with reserve.

The rates of yield from small holdings in the Federated Malay States and Straits Settlements are higher than those from the estates of 100 acres and over and confirm figures of a similar nature published in past years. Further confirmation of the yield per acre from small holdings was obtained by Meads,* who took records of 75 small holdings distributed throughout the country and found a yield at the rate of 477 lbs. per acre.

(iii) Prices.

The price of rubber rose steadily from May onwards, largely on the expectation of some form of restriction of production or exports. The average monthly Singapore prices of standard smoked sheet and the average prices for small-holders' rubber of various grades in Singapore and Penang are given in Table 8. Details of prices in Districts are now published monthly in *The Malayan Agricultural Journal*.

* Meads, H. D.—“Bark Consumption and Bark Reserves on Small Rubber Holdings in Malaya”, Special Bulletin, Department of Agriculture, S.S. and F.M.S. Economic Series No. 4, 1934.

Table 8.

Market Prices of Rubber from Small Holdings, Malaya 1933.
(Dollars (S.S.) per picul of 133½ lbs.).

Month 1933	Singapore			Penang
	Smoked Sheet	Unsmoked Sheet	Scrap	Unsmoked Sheet
January	8.00	7.00	3.20	—
February	4.00—8.00	3.00—6.80	1.00—4.00	—
March	7.60	6.80	2.50	—
April	7.80	6.80	2.70	8.60—6.20
May	11.80	11.00	5.00	7.00—10.30
June	13.50	12.25	5.00	11.20—14.00
July	17.50	16.00	7.00	12.00—18.40
August	15.00	14.00	6.00	13.00—15.50
September	15.00	14.00	5.50	11.50—13.50
October	15.50	14.50	5.00	12.60—14.40
November	16.50	15.00	5.00	12.60—14.20
December	16.50	15.50	5.50	13.30—14.60

(iv) Labour

Returns have been rendered to the Statistics Department by estates of 100 acres and over respecting the labour force employed at the end of 1933. The total labour employed on rubber estates in the Federated Malay States is 124,500, of whom 85,900 are Indians and 33,400 Chinese. Dependents of this labour force resident on estates are 47,600, of whom 43,550 are Indians and 2,800 Chinese. Of the Indian dependents 34,100 are children.

Corresponding returns from rubber estates in the Straits Settlements give :— Labour force 25,500 of whom 15,000 are Indians and 5,400 Chinese and 3,700 Malays : dependents 8,900 of whom 7,000 are Indians (including 5,700 children).

Similar figures for the Unfederated Malay States are not yet available, but from such returns as have been received, it is noted that the proportion of Malays employed is much higher than it is elsewhere in the Peninsula.

Information respecting the labour force employed on holdings of under 100 acres would be interesting but is impossible to collect. In the following

table (9), shewing the number of labourers employed per 100 planted acres of rubber, on estates of 100 acres and over, the first column gives the nationality of owners, subsequent columns shewing the nationality of labour employed by each group of owners.

Table 9.

Number of Labourers employed per 100 planted acres of Rubber
December 1933.

OWNER OF ESTATE	EMPLOYEES					
	Indian Labourers	Chinese Labourers	Javanese Labourers	Malay Labourers	Other Labourers	Total Labourers
STRAITS SETTLEMENTS :—						
Non-Asiatic	9.46	1.22	.39	.94	.14	12.15
Chinese	1.18	6.07	.80	3.72	.10	11.87
Indian	8.39	3.24	.42	.26	—	12.21
Others	2.73	5.26	3.38	3.19	—	14.56
FEDERATED MALAY STATES :—						
Non-Asiatic	10.20	2.70	.18	.17	.03	13.28
Chinese	1.20	9.10	.28	.75	.02	11.35
Indian	6.77	5.97	.22	.62	—	13.58
Others	1.98	8.95	.46	2.30	—	13.69

THE COLOURED SCUMS OF PADI FIELDS.

BY

W. N. SANDS,

Principal Agricultural Officer, Kedah.

Early in each season after cultivation has been started in the flooded padi fields, coloured scums appear on the surface of the water. The colours range from bright green to brick-red and very striking effects are produced over large areas, especially during periods of sunshine.

The colours are not due to mineral salts, or other matter in solution or suspension, but to myriads of minute motile algae. The phenomenon is particularly noticeable in fine weather because strong light attracts the organisms to the surface of the water, where, owing to their enormous numbers, they form a thin scum. This scum often drifts to the sides of fields with the surface currents caused by the prevailing breezes.

If a small quantity of water with green scum is collected and examined in bright light under a microscope, it is seen to contain several forms of minute, swiftly moving bodies containing chlorophyll. The most abundant species is an elongated, more or less fish-shaped one which has been identified by Professor M.O.P. Iyengar, University Botany Laboratory, Teynampet, Madras, as *Euglena proxima*, Dang. Two other smaller round forms also occur, but are not as abundant, and these also have been named by Professor Iyengar as *Trachelomonas volvocina*, Ehrenb., and *Trachelomonas intermedia*, Dang.

All of the species belong to the genera of lower plants which are grouped under the Volvocales. In this group there are two chief divisions: (a) that in which the plant consists of a few to many cells collected together and enclosed in a jelly-like envelope to form a family (coenobium) and (b), where it exists as a single cell and leads an isolated existence. The three species described belong to the latter division. Each consists of a single cell with a long fine whip-like appendage (flagellum) which protrudes through the gelatinous envelope at one end of it, and which by its active movement enables the alga to swim rapidly through the water.

The younger green stage of these algae is succeeded by the older dark-red one. This colour-change is due to some alteration in the character of the chlorophyll and is associated with the solidifying of the envelope and other changes to form the oospore, or resting stage, of the plant.

Abstract.

NINETEENTH REPORT OF NATIVE RUBBER CULTIVATION IN THE NETHERLANDS INDIES.

Second Quarter 1934.

*Prepared by the Bureau of Agricultural Economics of the Agriculture
Fishery Service of the Netherlands Indian Department of Economic
Affairs at Batavia, Java, and dated 12 September 1934.*

The Report covers the second quarter of 1934 and gives incidental data to the end of August 1934.

General Review.

The April reports on the progress of the restriction plans increased the confidence felt of speedy and favourable solutions of the problems raised in the negotiations. Rubber prices advanced until May 8, when the quotations for standard Java sheet in Batavia were 23 cents per $\frac{1}{2}$ kgm. Thereafter there was a reaction as a result of the publication of the provisionally fixed restriction percentages, which were lower than the rumours first spread had led the public to believe. As a consequence, standard sheet fell to $17\frac{7}{8}$ cents on 24 May. In June the price slowly recovered and the month closed with a quotation for Java standard sheet in Batavia of $21\frac{1}{4}$ cents per $\frac{1}{2}$ kgm.

The average for the first half of July was slightly higher and amounted to 21.8 cents and in the second half of that month the average was 22.1 cents. This increase in price continued during August and the first and second halves of the month shewed average quotations of 22.4 and 23.4 cents respectively.

At first the price of "blanket" rose more sharply than that of "sheet" and on May 8 the price relation was 84: 100. Thereafter, the relation changed in a way less favourable for "blanket". On 1 July the "blanket" price was only 72 per cent. of the price of standard sheet. This phenomenon was probably connected with the very large offers of wet native rubber made to the re-finishing factories. In June, a greatly diminished offer of native rubber was coupled with an improvement in the price relationship, so that the average quotation for June for "blanket" was about $77\frac{1}{2}$ per cent. of the average for "sheet". In July and August the percentage changed but little.

According to the international rubber agreement which came into force on 1 June, a basis quota of 358,000 tons of dry rubber was assigned to the Netherlands Indies. This was divided between the estate rubber and the native rubber in the proportion of 100 : 71½, a relationship that existed in 1929 between the exports of the two categories and is more favourable to the native rubber than the figures in any other subsequent years. In this way, the basis quota for native rubber was fixed at 149,000 tons, 169,000 tons, 188,000 tons, 198,000 tons and 205,000 tons in the years from 1934 to the end of 1938.

An individual restriction scheme was drawn up for the estates based on the data presented, and the standard production of the estates between which the export quota was to be divided was worked out from these data. It proved that this scheme was not applicable to the native rubber in the outer islands because in the first place, the necessary data for the calculations of basic standard productions were not available and the accumulation of these figures would have involved much time and costly work, but still more so because the potential production of the native rubber plantings was believed to be so great that if it were divided into the total quota permitted the individual amounts would have been very small. This would have implied that that portion of the population making its living principally by family-worked rubber plantations would have suffered at the expense of the owners of remote, often neglected plantations, or of plantations that are so large that they can only be worked by the aid of hired help; owners, in other words, who in the present circumstances cannot be regarded as genuine producers.

After prolonged conference and after taking into consideration all the difficulties that presented themselves, the Government decided to enforce the restriction on native rubber by imposing a special export tax, based on the experience that there existed a definite connexion between the price of rubber and the amount of native rubber exported. A reduction of the amount exported could therefore be brought about by manipulating the export tax.

This export tax was fixed for June at 10 cents per kgm. of dry rubber, with this stipulation, that the tax should be applied at once beginning on June 1 on all wet rubber (groups II and III of the export schedule). This postponement of 1½ months for the dry rubber was decided on in view of the time needed for the refinishing factories to prepare and dry off their end-product, blankets and bark-crepe.

Beginning on July 1 the basis of the export tax was raised to 16 cents per kgm. (to take effect for group I rubber on August 16), and on August 1 this basis tax was raised again to 20 cents (to take effect for Group I rubber on September 16). This same basis has been maintained for the month of September.

The effect of the export tax is shewn in the following table.

Exports of Native Rubber from the Outer Islands in Metric Tons.
(Calculated as the dry equivalent) Divided into Groups.

1934	Group			Total	Percentages of the total		
	I	II	III		I	II	III
January ...	2,341	322	12,630	15,293	15	2	83
February ...	2,296	346	12,033	14,675	16	2	82
March ...	3,239	430	17,077	20,746	16	2	82
April ...	3,740	411	16,944	21,095	18	2	80
May ...	4,877	991	22,223	28,091	17	4	79
June ...	5,182	556	11,830	17,568	29½	3	67½
July ...	6,750	554	9,038	16,342	41½	3	55½
August ...	5,618	304	6,538	12,460	45	2½	52½

(July and August provisional figures).

From the above table it may be deduced that the export tax is slowly having the desired effect, although the exports in August are above the allotted quota, which taking account of the internationally agreed restriction percentage of 0,0,10 and 10 in the months from June to September, should have been 11,250 tons in August.

The above figures also shew that the exports of dry rubber have increased at the expense of other grades. This is a result of the fact that with the high export tax, the advantages of the local preparation of dry rubber are much more obvious than formerly.

These advantages are temporarily increased because the period of 1½ months, which has been allowed for in fixing the export tax so as to give the re-finishing factories time for preparing and drying their end-product, proved to be quite ample for factories with well warmed drying sheds and for the people at large more than ample for the preparation of native sheets. The stimulus arising from this source in favour of preparing a dry product will, however, only be maintained as long as the tax must still be periodically raised.

In the past few months the rubber re-finishing factories have been working full time. In addition to this, reports are coming in from all sides concerning the importation of a large number of hand-mangles for preparing native sheets which are largely brought from Singapore and can be delivered for about f 15.00 each. This is especially taking place in the Western Division of Borneo, where many hundreds of mangles have been imported, with the result that in August the exports of wet rubber from that region were reduced to only 35 tons. The percentage of the total native rubber production exported as dry rubber was 17 per cent. from January to May, rose to 29½ per cent. in June, 41½ per cent. in July and 45 per cent. in August.

Another consequence of the imposition of the heavy export tax on native rubber has been that both the natives themselves and the exporters shew a general tendency to finish the product dryer than formerly; that is to say, to export the wet rubber with a smaller percentage of water in it than that on the basis of which it is taxed, thereby paying less tax on the finished article.

Since in this way the export tax was being avoided and its effect being negated so that more rubber was actually being exported than appeared in the statistics, a general control was instituted by examining samples to find the actual loss in washing of exported batches of native rubber. In this way it was possible, by continually revising the conversion percentages for expressing the wet rubber as the dry equivalent, to adjust the calculation of the amount of dry rubber exported and the tax to be imposed as nearly as possible to the actual conditions of affairs.

Inseparably bound up with the restrictive system of export taxes on native rubber is the principle that the returns from these taxes shall be employed for the benefit of the inhabitants of the rubber-producing areas. This tax is not a fiscal imposition but merely a means of securing restriction. A portion of the value of the products he wishes to export is withheld from the exporter, which can only be defended in principle if the amount so withheld is applied at once indirectly to benefiting the districts from which the product came.

With this in mind, a beginning was made in July by lightening the fiscal burdens of the inhabitants (principally payment of the commutation taxes for enforced labour on behalf of the Government and municipalities from the sums received for the export tax, lightening obligations incurred in the matter of ground rent, concessions in regard to income taxes and land taxes, and so forth). In addition to this, money was ear-marked for performing useful works, providing information for the agricultural groups of the inhabitants (principally in regard to the preparation of rubber), for sanitary measures, while some Divisions wished to use the money for introducing another restriction scheme.

In regard to this latter idea it may be remarked that in Bangka and Billiton and Riouw Free-area, districts in which many registered Chinese leasehold estates are to be found and the production possibilities of the rubber plantations are not so out of all proportion far above the export quota that might ultimately

be assigned to the various Divisions, earnest efforts were made to pass over as soon as possible to individual restriction. Such steps are also being considered in the Divisions of Tapanoeli, Acheen and the estate area of Sumatra's East Coast.

In the months when rubber exports were large, especially from the larger rubber regions (Borneo, Djambi and Palembang) it was reported that there were still extensive areas of tappable rubber still untapped. During these months the family tapping system more and more gave place to the sharing systems, or to tapping by hired labour. Reports from the most recent months, however, indicate that in view of the reduced direct income to be derived from rubber growing the family tapping system is again coming into general practice.

The farming of foodstuffs held the full attention of the natives during the period being reviewed, which may be regarded as a good general sign, especially in these times of crisis, since in this way a certain degree of stability was guaranteed for the small farmer and the native community in general.

Local Reports.

Acheen and Dependencies.—In preparation for the possible institution of an individual restriction scheme, the native plantations in the Division of the East Coast of Acheen (the most important rubber district in the region) were registered. The number of *tappable* trees in the Sub-Divisions of Langsa and Tamiang of the above mentioned Division amounted to about 866,000 belonging to 2,907 owners.

The production figures for 150 native plantations were observed in order to calculate the average production per day. The result of this investigation was that 100 tappable trees yielded an average of 0.56 kgms. of dry rubber per tapping day.

Tapanoeli.—The imposition of the extra export tax appeared to have but little influence on production during June and July. This was due to the fact that the tax on dry rubber, the grade almost exclusively produced in Tapanoeli, only came into force in the middle of July.

Sumatra's West Coast.—In spite of the imposition of the extra export tax, the exports of rubber from Padang during June and July remained reasonably high, but fell off in August. The exports of native rubber by way of Sumatra's East Coast and Djambi increased in the second quarter of the year. The lower export tax in Pakan Baru and Djambi led to these places attracting a larger amount of the production of Sumatra's West Coast than usual. Beginning from the first of September the normal relationship will have been restored.

Palembang.—The exports from Palembang remained in May practically the same as the amount expected in April. There was no laying in of stocks; the monthly productions were regularly shipped. The smaller exports in June were partly due to the wintering of the trees. In the months of July and August the export tax and the work on the dry-rice fields exerted a marked influence on the already falling production.

The announcement that after May 1 strict measures would be taken against violations of the rubber assay regulations put an end to the practice of mixing scrap with the slabs and preparing slabs of too great thickness. The preparation of thinner slabs resulted in a diminution of the average water content.

Djambi.—The exports from Djambi fell off greatly in June to well below the average of the previous months. July and August shewed a still further fall. The reduction of the rubber tapping took place not only under the influence of the extra export tax but also because of the great demands on labour made by the ladang (dry rice) cultivation during this period.

The natives have already taken to making sheets to some extent, and the slabs exported are thinner and dryer than formerly.

Many iron hand-mangles were imported and this, coupled with the greater activity of the re-milling concerns and the preparation of dry sheets by the natives, resulted in an increase in the exports of dry rubber from 83 tons in April to 449 tons, 518 tons, and 335 tons in June, July and August respectively.

The exports from Djambi consist at the present moment almost entirely of wet rubber in the form of mixed wet products.

Riouw and Dependencies.—The exports from Indragiri declined in May, but increased again in July and August.

Bangka and Dependencies.—In April and May there was a marked decline in production, attributed to the harvesting of pepper, preparation of the land for dry padi planting and wintering of the rubber trees. According to rough estimates, during the first half of May some 80 per cent. of the tappable plantations were in production.

Western Division of Borneo.—Rubber production increased in the second quarter on account of termination of the rice harvest. In May 4,887 tons (dry equivalent) were exported. There was a falling off of production in some areas in June, and in August a marked diminution of the exports as a result of the imposition of the extra export tax.

Large scale production of dry rubber was begun.

All the re-finishing factories were working at full capacity. During the past few months there has been a great importation of iron hand-mangles from Singapore; Pontianak reports hundreds of mangles, Sambas an even greater number. As a rule the latex, after being strained, is now coagulated with acetic acid, rolled out into thin slabs in the mangle and dried several days in the sun. Then the half dried sheets are sold to the exporters who further prepare them in smoke houses to native smoked sheets and sell this product to Singapore, where there is a constant market for it.

The hand-mangles are often in the possession of the buyers who settle in the neighbourhood of a group of native plantations.

Southern and Eastern Division of Borneo.—This Division, with an export of 6,060 tons in May, created a record for the export from any Division in

this country in one month. A definitely greater activity was seen in the re-finishing industry. Exports during July and August were also at a high level.

In this Division, too, many hand-mangles were imported. There are plans for taking in hand the purchase and conversion of latex for preparing native smoked sheet on a large scale under the leadership and instruction of the Government.

Exports.

The exports of native rubber (dry equivalent in metric tons) from the Outer Islands to foreign countries during the first quarter of 1934 amounted to 50,714 tons, and in the second quarter to 66,754 tons, as compared with 13,420 tons and 25,597 tons for the first two quarters of 1933. The July and August 1934 exports (provisional figures) were 16,342 tons and 12,460 tons respectively.

Reviews.

Spices and Condiments.

H. G. Redgrove. 340 pages, bibliography and indexes; 26 half tone and 17 line illustrations Sir Isaac Pitman and Sons, Ltd., London, 1933.

Price 15 shillings.

The object of this book, according to the author, is to provide an accurate and comprehensive account of spices and condiments for the spice-user. Mr. Redgrove points out that since Ridley's book on spices was published in 1912, considerable advances in knowledge have been made. Further, Ridley's book is essentially one for the spice-grower while the present work deals particularly with the botanical sources and chemical constituents of spices.

The book is divided into six sections. Section (i) is concerned with the uses of spices in dietary and the means by which ground spices, essences and essential oils are prepared for flavouring food and other uses. The remaining sections deal with the various spices themselves. The author adopts as a means of classification, a system based on the part of the plant from which the spice is obtained. The plants described are therefore grouped in the following sections—(ii) rhizomes and root spices. (iii) bark spices. (iv) flower spices, (v) fruit spices, and (vi) seed spices. This system is chiefly useful to the spice-user. From a botanical standpoint it has disadvantages since, in certain cases, plants of close affinity are separated. Attention is drawn to the various distinctions made between spices and condiments. The author suggests the use of the term "condiment" to denote a spice, or other seasoning material, used in a particular manner *i.e.* added to food which has been served.

The agriculturist will find the book of considerable value since it provides a clear description of all spices cultivated together with their correct botanical status, uses, and chemical constituents. It is not a guide to cultivation but rather a clear and concise reference book of general information. Spices of especial interest in Malaya are as follows:—ginger, turmeric, cloves, chillies, pepper and nutmeg. All these thrive under local conditions and are produced commercially. Others grown in the experimental stage are: zedoary, *Curcuma zedoaria*; lesser galangal, *Alpinia officinarum*; cinnamon, vanilla, and cardamom.

The author states that Malaya, once celebrated for its spices, has in recent years turned to the cultivation of rubber, which, in the long run, has not proved as profitable as confidently predicted. The statement is probably correct but the inference is erroneous. Prices of most spices recently fell to a low level and in several cases *e.g.* cinnamon, cloves, and pepper, proved unremunerative owing to over-production. The majority of spice crops require considerable expenditure in cultivation and manuring, and crop at infrequent intervals. With a limited market and fluctuating returns, it has been a doubtful proposition for landowners to plant spices when rubber has often offered such excellent prospects. The future is more hopeful, since under existing legislation rubber may not be planted and attention will be directed to other crops which offer possibilities.

J. N. M.

Fodder and Feeding Stuffs in Malaya.

*C. D. V. Georgi, 35 pp. Department of Agriculture, S.S. and F.M.S.,
Special Bulletin General Series No. 17, 1934. Price 50 cents.*

Of late years it has become realised in an increasing degree that the feeding of animals is a process which requires knowledge and skill for its successful practice.

The rule of thumb methods which previously prevailed have become replaced by the computation of rations on a scientific basis; the principles underlying feeding are now well understood and it is possible by varying the ingredients of an animal's food to fit it with considerable exactness to the duty which it is required to perform.

Information on the subject is, however, not always available to the agriculturist and planter in Malaya; in this bulletin Major Georgi has described the general principles involved and has supplemented it by analytical data concerning the composition of foodstuffs which are ordinarily employed in this country.

Interest in animal husbandry in Malaya is gradually extending and as the country becomes more permanently settled it may be expected to increase still further.

The work will be found to be of practical utility by all who are interested in animal husbandry and who feel their need for a handy work of reference in relation to the feeding of stock. With the information in this bulletin, stock breeders should find it easily possible to compute rations for their animals and to arrange their purchases of feeding stuffs in such a way as to secure the best results.

H. A. T.

Departmental.

FROM THE DISTRICTS.

*Compiled by the Chief Field Officer from Monthly Reports
submitted by Field Officers.*

The Weather.

In Kedah, Province Wellesley, Penang and the northern Districts of Perak, more or less severe flooding was experienced during the opening period of the month, which tended to bring the average precipitation above normal. In all other parts of the country, more particularly in the inland areas where conditions were abnormally dry, the average rainfall was not maintained.

Remarks on Crops.

Rubber.—Compared with prices for the previous month, price quotations over the period under review show little change. Scrap, and similar low qualities for which there has been no recent demand, has been bought in many centres throughout the country at about \$15 to \$17 per picul.

Extremely wet weather in Kedah, Province Wellesley and the Krian and Selama Districts of Perak during the early part of the month, restricted tapping, and difficulty was experienced in these areas in obtaining sufficient rubber to cover coupons. In the Krian District the force of storms and flood was sufficiently severe to cause very extensive destruction of trees on both small-holdings and estates.

As the result of conditions favourable to the fungus development, the control of mouldy rot and other bark diseases was rendered difficult. The position was further aggravated in rice-producing areas by the incidence of the planting season.

In other centres, with the exception of Johore, where weather conditions more nearly approximated normal, conditions are reported to be satisfactory. Tapping systems are not extravagant, progress in general upkeep is maintained, and on many Chinese properties thinning out has been noted.

In Johore, however, tapping continues to be severe, and every effort is being made to increase production. Catch crops, such as gambier and pine-apples are being removed, and in some cases where arecanuts have been inter-planted with rubber, the former are being cut out and disposed of for fishing stakes.

The departmental organisation for the distribution of approved fungicides continues to receive an increasing and satisfactory measure of support.

A somewhat widespread infection of *Oidium Heveae* was reported from the Segamat District of Johore; with the onset of rains, however, it is probable that the disease will rapidly diminish.

Asiatic Rubber Instructors attached to the Small-holders Advisory Service which was inaugurated in July, have made very satisfactory progress in the areas where they are at present stationed. As a direct result of their instructional activity, the manufacture of rubber from small holdings is already showing improvement, and much useful information is being accumulated.

Rice.—Heavy rains in the northern States caused much flooding in rice-producing areas, more particularly in Kedah and the Krian District of Perak. Newly-planted seedlings were extensively damaged. The staff of the Department rendered much assistance in the collection and distribution of seedlings to areas where nurseries had been destroyed. As adequate reserves of well-grown seedlings were available to replace losses, no permanent damage is anticipated.

In the more important rice-growing areas of the country, planting has made good progress, and crops so far present a satisfactory appearance.

Conditions of growth in the Segamat District of Johore are good, although water shortage has been experienced and some rat damage sustained. The "sawah" (wet padi fields) competition in this District has aroused much interest. Rats and birds have been responsible for much damage in this District. In the Muar District, however, little interest has been taken in rice planting, and the area under cultivation will be considerably less than that of last season.

Coconuts and Copra.—There has been no price improvement over figures for the previous month, and in many centres copra manufacture as a small-holding industry has declined.

A local Malay-owned kiln in Province Wellesley has again obtained Penang f.m.s. price for copra produced.

In Perak, rain and the incidence of padi planting hampered copra production in the District of Krian. Small-holding copra in the Bagan Datoh District brought \$2.40 to \$2.60 per picul. A satisfactory selling arrangement has now been made for the disposal of good quality copra from this centre, the standard of the product being guaranteed by an officer of this Department.

Further developments in the erection of improved small-holders' kilns are reported from Johore. A large kiln is now in course of erection at Ringgit, and it is probable that the pattern will be copied by other local manufacturers.

Fruit.—Durians and mangosteens are being harvested in Kelantan; jambus are cropping in the coastal areas of Johore and dukus in the Muar District. Machang, mempalam and jambu are in season in the Klang District of Selangor, and durians, machang, mata kucing and rambutan are available in Pahang. Crops, however, are irregular and generally poor.

Tapioca.—In Kedah a further 802 acres were planted to this crop in the Kulim District.

Owing to the shortage of raw material a factory in the Segamat District of Johore is closing down; a large plant, however, is being erected on the Kluang—Mersing road to deal with the crop in that locality.

Tobacco.—Interest in this crop is being maintained in the Kuala Muda District of Kedah, Perak Central, Pahang East and the Kluang and Batu Pahat Districts of Johore.

Arecanuts.—It is reported from Johore that prices of arecanut produce have advanced, especially for “Iris” and “Kosi” qualities: supplies however are short.

Pineapples.—All factories in Johore were closed down during the month. This off-season is being utilised for overhauling plant in readiness to commence the new season's operations during October-November.

In this State, small areas continue to be opened up for pineapple cultivation as a sole crop.

Padi Stations and Test Plots.

In Kedah, heavy and continuous rains checked the development of the plants in most of the plots at the Telok Changai Experimental Station, but subsequent dry weather led to an improvement. The Rantau Panjang Test Plot was flooded to a depth of $2\frac{1}{2}$ to 3 feet for four days shortly after planting, but it is not thought that much permanent damage has been done. A total of 3,926 gantangs of selected padi seed and 84 large bundles of seedlings were distributed from departmental sources, and in addition, 4,842 bundles of seedlings were collected in the Kota Star District for distribution at Padang Lalang, to repair flood-damaged crops in that area.

Experimental areas in the Krian District of Perak were subjected to severe flooding which impeded progress. In most cases the crop was sufficiently robust to withstand the adverse conditions and no permanent damage has been sustained. With the subsidence of the water the planting programme was continued, and by the end of the month was nearing completion.

In other Stations and Test Plots, work has made satisfactory progress, despite in some cases the lack of adequate irrigation facilities.

Good progress continues to be made on new experimental areas in the course of development at Sungei Manik in Perak, Sungei Blat in Pahang and Panchang Bedina in Selangor.

Agricultural Shows.—The Department staged an instructional exhibit, and arranged lectures illustrated by lantern slides on subjects of interest and importance to small-holders at Shows held at Bentong and Raub in Pahang, Kuala Langat in Selangor and Mersing in Johore.

Rural Lecture Caravan.

A tour of the caravan in Pahang, which commenced during August, was completed on September 16th, important centres on the Pahang river and along the coast, and Pulau Tioman being visited. As usual, much interest was evinced and attendances were satisfactory.

DEPARTMENTAL NOTES.

Visit of the Acting Director of Agriculture to Kelantan and Trengganu.

At the request of the Kelantan Government the Acting Director of Agriculture visited that State from September the 3rd. to the 5th. inclusive, for the purpose of inspecting the Central Agricultural Station at Kota Bharu and the Pasir Puteh Padi Test Plots, reporting on the general agricultural work in progress and making suggestions for future developments.

On the conclusion of this visit he proceeded to the Besut, Kuala Trengganu and Kemaman Districts of Trengganu during the period September 6th. to 12th. inclusive in order to make recommendations at the request of the Government for the development of agricultural activities in that State.

Leave.

Mr. R. G. H. Wilshaw, Assistant Chemist, has been granted 24 days full-pay leave from 6 September 1934 to be followed by 4 months and 7 days leave on half-pay on the ground of ill-health.

DISTRICT AGRICULTURAL SHOWS.

Kuala Langat, Selangor.

After a lapse of six years, an Agricultural Show was held in this District at Morib on 23rd September, 1934. This is the third Show to be held in the Kuala Langat District.

Heavy rain fell in the morning which somewhat delayed the opening, which was performed by H.H. The Sultan of Selangor in the presence of a large gathering that included The Hon'ble the British Residents of Selangor and Negri Sembilan.

The Show was housed in temporary sheds, which were tastefully decorated, each *Penghulu* being responsible for one section.

All the sections were fully occupied with the exhibits, in spite of the fact that poor exhibits were rejected before the staging commenced. One of the most successful sections was that devoted to padi. Rubber exhibits were few in number, but of greatly improved quality.

The Department of Agriculture, the Rubber Research Institute of Malaya, the Health Department and the Infant Welfare Centre staged exhibits and demonstrations of an instructional nature.

A demonstration by the Malay Regiment and a display by four aeroplanes from the Kuala Lumpur Flying Club were the main items in an attractive programme of amusements which also included a physical strength display, fancy dress football match, a hockey match; and at night a Malay *ronggeng*, a *bangsawan* and a Tamil drama.

Besut, Trengganu.

The first Agricultural Show for the Besut District of Trengganu was held at Kampong Raja on September 6th, 1934.

Sections were provided for padi, fruit, vegetables, poultry, and arts and crafts and the general standard of the numerous exhibits was good. There were also some good samples of home-made coconut oil.

The Show was well attended and aroused much interest; it is hoped that another will be held next year when a better understanding of the object of such shows may be expected to lead to an increase in the number of exhibits.

Bentong, Pahang.

A District Agricultural Show was held, in conjunction with the annual buffalo show, at the Government English School, Bentong, on Sunday, 9th September. The opening ceremony was performed by the Hon'ble The British Resident of Pahang in the presence of a large audience.

The usual competitive sections were provided but although exhibits were numerous, the general standard of quality was only fair. It was unfortunate that exhibits were much too crowded which resulted in a large portion of them not been seen and rendered judging difficult.

The Department of Agriculture staged an educational exhibit of local interest and two Malay Officers were fully occupied in explaining the essential points of the exhibits. In the evening lantern lectures were given on poultry breeding and control of mouldy rot disease of rubber.

The buffalo show consisted of the winning beasts from the mukim competitions; some very excellent animals were exhibited.

Buffalo and Stock Show, Raub.

Of particular interest was the Buffalo and Stock Show held at Raub, on the 8th September.

Exhibits in the buffalo section were the prize-winning beasts from the mukim show and accordingly were of a high standard of quality.

Classes were also provided for goats, milking cows with calves, and poultry; the exhibits in the last section were definitely poor.

The Medical Department staged an exhibit dealing chiefly with child welfare and control of disease.

The Department of Agriculture staged an exhibit similar to the one at the Bentong District Show; a lantern lecture on poultry-keeping was given in the evening.

During the afternoon a buffalo timber hauling contest was held.

The Show was an undoubted success as was proved by the numbers of entries and the interest shown by local cultivators.

Statistical.

MARKET PRICES

September, 1934.

Rubber.—During September rubber failed to maintain its recent advance in price and at 24½ cents per lb. for spot loose in Singapore closed at 1¼ cents per lb. less than its opening price. The average price for the month in Singapore of Smoked Sheet equal to London Standard was 25.09 cents per lb. as compared with 24.8 cents per lb. in August. The average price for September in London was 7.41 pence per lb. and in New York 15.26 cents gold per lb. as compared with 7.4 pence and 15.37 cents gold respectively in August.

Weekly prices paid during September for small-holders' rubber at three centres are shewn in Table I.

Table I.

Weekly Prices Paid By Local Dealers for
Small-Holders' Rubber, September, 1934.

(Dollars per Picul.)

Grades.	Kuala Pilah,† Negri Sembilan.				Kuala Kangsar, Perak.				Batu Pahat, Johore.		
	6	13	20	27	5	12	19	26	5	12	26
Smoked sheet	30.70	30.58	29.00		3.012	30.12	29.46	28.84			27.70
Unsmoked sheet	26.92	24.68	27.14	27.09		26.69	25.92	26.04	26.50	27.09	
Scrap		15.00	15.00		15.00	15.83	16.00	16.50			16.30

Transport by lorry Kuala Pilah to Seremban 15 cents per picul, to Malacca excluding duty, 25 cents per picul, by rail Seremban to Penang \$1.24 per picul, Seremban to Singapore \$8.00 per ton.

Transport from Batu Pahat to Singapore by lorry excluding duty, 90 cents per picul.

Transport from Kuala Kangsar to Prai by railway \$6.20 per ton.

Transport from Kuala Kangsar to Singapore by railway \$10.00 per ton (minimum consignment 5 tons).

At Kuala Pilah the standard deduction for moisture in unsmoked sheet is 5 per cent.

At Kuala Kangsar the standard deduction for moisture in unsmoked sheet is 10 per cent.

No purchases at Batu Pahat on 19th September.

† Kuala Pilah, 30th August, 1934. The price of unsmoked sheet should read \$28.22 and not \$20.44.

Palm Oil.—Prices for the whole month for the Malayan commodity are not available, but those for the beginning of September are shewn in the following table and indicate that the recent improvement in this market is being maintained. Basis 5 per cent. f.f.a.

Table II.

DATE 1934.	PALM OIL			KERNELS
	L'Pool/Holland/ Hamburg c. i. f. landed weights in bulk per ton £. s. d.	L'Pool/Continent c. i. f. per ton net in barrels £. s. d.	Halifax (Nova Scotia) c. i. f. landed weights per lb. Cents gold.	Fair Average Malayan Quality c. i. f. Landed Weight per ton on Continent. £. s. d.
September 5	12 0 0	14 10 0	—	7 0 0
	Later prices	not available.		

Copra.—The September prices of copra in Singapore continued almost unchanged at the present low levels. The sun-dried grade opened at \$2.90 per picul, to close at \$3, with an average for the month of \$2.93 as against \$3 in August. The mixed quality only averaged \$2.28 per picul as compared with \$2.40 in August.

Copra cake maintained its improved price and averaged \$1.77 per picul for the month.

Rice.—The average wholesale prices of rice per picul in Singapore during August were as follows:—Siam No. 2 (ordinary) \$3.13, Rangoon No. 1, \$3.16, Saigon No. 1 (long grain) \$3.17, as compared with \$2.78, \$2.77 and \$2.82 in July. Corresponding prices in August 1933 were respectively \$3.78, \$3.01 and \$3.47.

The average retail market prices in cents per gantang of No. 2 Siam rice in August were:—Singapore 23, Penang 24, Malacca 23, as compared with 22, 24 and 23 respectively in July.

The average declared trade value of imports of rice in August was \$3.03 per picul as compared with \$2.85 in July and \$2.93 in June.

Padi.—The price paid for padi at the Government Rice Mill, Bagan Serai, remained unchanged at \$1.50 per picul. A privately owned mill paid \$1.40 per picul. Prices per gantang ranged from 5 cents to 12 cents in various parts of the country.

Tea.—Malayan tea was quoted in London during August at from 11d. to 1s. 0½d. per lb.

Average London prices per lb. for tea consignments from other countries were as follows:—Ceylon 1s. 0.74d., Java 9.99d., Indian Northern 1s. 1.43d., Indian Southern 1s. 0.06d., Sumatra 9.64d. There was a further steady decline in prices during the month.

Tuba Root (Derris).—The Singapore average price of roots sold on rote-none content remained at \$40 per picul during September, but owing to the scarcity of supplies, only small quantities of the roots sold at this figure were up to the minimum standard of 3 per cent. required by the trade.

Little business was done in roots sold on a basis of ether extract as the high price demanded in recent months has created a deadlock, buyers abroad offering considerably less than the local market price. The average price for the month was \$30 per picul as compared with \$34.50 in August.

Prices paid to growers in Johore ranged from \$24 to \$30 per picul.

Coffee.—Singapore prices of coffee in September shewed little variation in comparison with those of August. Sourabaya coffee opened at \$19.50 to \$20.50 per picul and weakened slightly to close at \$19 to \$20. Palembang coffee opening at \$13.50 per picul, closed at \$13, an average of \$13.19 for the month as compared with \$13.32 in August.

Local prices for coffee beans ranged from \$13 to \$30 per picul.

Areanuts.—September average prices in Singapore were as follows:—Splits \$4.81 to \$5.88, Sliced \$9.38 to \$10.38, Red Whole \$6.31 to \$6.81, Kelantan \$5.38 to \$5.63, the price in each range depending upon quality. No prices were quoted for Bila Whole and Sourabaya Whole.

The average prices per picul quoted by the Singapore Chamber of Commerce were:—Best \$4.87, Medium \$4.58, Mixed \$4.02.

Gambier.—Singapore prices improved during September, closing at \$4.75 per picul for Block, and \$8.25 per picul for No. 1 Cube. The respective averages for the month were \$4.40 and \$7.70 as against \$4 and \$7.31 in August.

Pineapples.—The Singapore market is at a standstill; harvesting of the winter crop will commence shortly and the factories will re-open in October. Average prices per case quoted for the month were:—Cubes \$3.11, Sliced Flat \$3.04, Sliced Tall \$3.25 as compared with \$3.16, \$3.11, and \$3.28 respectively in August. Prices for fresh fruit ranged from 70 cents to \$4 per 100, according to quality. In Selangor, Sarawak pines ranged from \$4 to \$14 per 100.

Tapioca.—There were no fluctuations in the Singapore market during September with the exception of Pearl Seed which dropped 25 cents per picul at the close.

Average prices per picul were:—Flake Fair \$3.65, Seed Pearl \$5.70, Pearl Medium \$5.85, as compared with \$3.73, \$5.75 and \$6 respectively in August.

Sago.—This market also remained practically unchanged, Pearl, Small Fair easing 5 cents per picul at the close to average \$3.94 for the month and Flour, Sarawak Fair was quoted throughout at \$1.92½ per picul. The August average prices were:—\$3.95 and \$1.89 respectively.

Mace.—The commodity was in short supply during September and prices in Singapore rose considerably. Siouw averaged \$90 per picul and Amboina \$57 per picul as compared with \$80 and \$51 respectively in August.

Nutmegs.—The Singapore market continued without change at the August levels of \$24 per picul for 110's and \$25 per picul for 80's.

Pepper.—Prices advanced almost daily during September under buying pressure in London, but at the close of the month values in London tended to ease, stocks were high, and speculative buying appeared to have ceased. Average prices per picul in Singapore were :—Singapore Black \$15.50, Singapore White, \$40.30, Muntok White \$41.70 as compared with August respective averages of \$13.69, \$36.63 and \$37.69.

Cloves.—Singapore prices continued nominal at Zanzibar \$35 and Amboina \$45 per picul.

Tobacco.—Prices of sun-dried leaves ranged from \$10 to \$65 per picul. Java tobacco was quoted in Perak at \$32 to \$70 per picul and in Johore at \$40 to \$85 per picul.

The above prices are based on London and Singapore daily quotations for rubber; on the Singapore Chamber of Commerce Weekly Reports for the month and on other local sources of information. Palm oil reports are kindly supplied by Messrs. Guthrie & Co. Ltd., Kuala Lumpur; the Singapore prices for coffee and arecanuts by the Lianqui Trading Company of Singapore, and tuba prices by Messrs. Mackay & Co., Singapore.

1 picul = 133½ lbs. The Dollar is fixed at two shillings and four pence.

Note.—The Department of Agriculture will be pleased to assist planters in finding a market for agricultural produce. Similar assistance is also offered by the Malayan Information Agency, 57, Charing Cross, London, S.W.1.

GENERAL RICE SUMMARY*

August, 1934.

Malaya.—Imports of foreign rice into Malaya during August were 54,515 tons and exports 15,191 tons, net imports accordingly being 39,324 tons. Net imports for the period January to August, 1934, were 302,241 tons, an increase of 7.5 per cent. over the corresponding period in 1934.

Of the imports during August, 47 per cent. were consigned to Singapore, 19 per cent. to Penang, 7 per cent. to Malacca, 17 per cent. to the Federated Malay States and 10 per cent. to the Unfederated Malay States. Of the total 68 per cent. came from Siam, 29 per cent. from Burma, 2 per cent. from French Indo-China and 1 per cent. from other countries.

Of the exports during the month under review, 57 per cent. were shipped to the Netherlands Indies and 43 per cent. to other countries. The various kinds of rice exported were:—Siam 8,233 tons (54.2 per cent.), Burma 4,335 tons (28.5 per cent.), French Indo-China 444 tons (2.9 per cent.), India 2,017 tons (13.3 per cent.), local production 162 tons (1.1 per cent.).

India and Burma.—Foreign exports for the period January to June, 1934, totalled 912,000 tons, as compared with 1,175,000 tons for the corresponding period in 1933, a decrease of 22.4 per cent.

The total exports of rice and bran from Burma for the period 1st January to 28th July, 1934, amounted to 2,713,728 metric tons as compared with 2,305,155 metric tons for the corresponding period of 1933, an increase of 17.7 per cent.

It is reported (*Straits Times*, Singapore, 29th August, 1934) that there has been a sharp rise in the Rangoon rice market and that there is a shortage in the balance of rice available for export as present stocks should be exhausted by the middle of November. It is the general opinion that prices in 1935 will be very strong owing to droughts in Europe and in other parts of the world, famine conditions in Central China and floods in India and the Far East.

Siam.—Exports of rice from Bangkok in July were 151,475 tons, giving a total for the first seven months of the year of 1,006,804 tons as compared with 961,789 tons for the similar period in 1933.

Japan.—It is reported in the *Trans-Pacific Journal* 23rd August, 1934, that the 1934 rice crop may fall 5 per cent. below a normal year's crop and it is estimated at 8,320,000 tons, a decrease of 1,616,000 tons, or 16 per cent. as compared with the actual crop in 1933.

It is also reported that notwithstanding the weather's recovery and sales of 140,250 tons of Government rice to the market, rice prices shewed no signs of falling.

French Indo-China.—Entries of padi into Cholon, 1st January to 15th September, 1934, totalled 1,182,288 metric tons, an increase of 34 per cent. as compared with 882,654 metric tons during the corresponding period of 1933. Exports of rice for the same period this year were 1,087,969 metric tons as compared with 985,914 metric tons for the similar period of 1933, an increase of 10.4 per cent.

* Abridged from the Rice Summary for August, 1934, compiled by the Department of Statistics, S.S. and F.M.S.

According to a report on the Saigon Rice Market for August, 1934, prices rose during the month due to demands from China and India but closed on a fall with an undecided tendency.

Netherlands Indies.—Imports of rice for the period January to June, 1934, (*Economic Bulletin*, dated 1st September, 1934) amounted to 87,616 metric tons, a decrease of 62.5 per cent. as compared with imports of 234,118 metric tons during the corresponding period of 1933.

The area of wet and dry padi harvested during the same period this year amounted to 6,896,240 acres as compared with 6,864,130 in 1933, an increase of 0.5 per cent.

Ceylon.—Imports for the period January to August, 1934, totalled 321,472 tons, as compared with 298,886 tons for the same period of 1933, an increase of 7.6 per cent.

Of the 1934 imports, 14 per cent. were from British India, 63 per cent. from Burma and 23 per cent. from other countries.

Europe and America.—Shipments to Europe from the East were 877,297 tons for the period 1st January to 16th August 1934, as compared with 924,164 tons during the corresponding period in 1933, a decrease of 5.1 per cent.

Of the 1934 shipments 40 per cent. were from Burma, 6 per cent. from Japan, 43 per cent. from Saigon, 9 per cent. from Siam and 2 per cent. from Bengal. The corresponding percentages for 1933 were 51, 3, 39, 6 and 1 respectively.

Shipments to the Levant from the East during the period 1st January to 28th July, 1934, were 21,715 tons as compared with 20,457 tons for the same period in 1933, an increase of 6.1 per cent.

Shipments to the West Indies and America for the period 1st January to 12th July, 1934, were 110,231 tons, an increase of 12.3 per cent. as compared with 98,132 tons during the corresponding period of 1933.

MALAYAN AGRICULTURAL EXPORTS, AUGUST, 1934.

PRODUCT.	Net Export in Tons.				
	Year 1933.	Jan.-Aug. 1933.	Jan.-Aug. 1934.	August 1933.	August 1934.
Arecanuts ...	20,756	13,513	21,967	1,592	2,373
Coconuts, fresh† ...	100,609†	68,066†	65,096†	8,530†	6,869†
Coconut oil ...	17,568	11,759	16,267	1,252	1,758
Copra ...	110,543	60,545	60,525	13,919	6,223
Gambier, all kinds ...	2,560	1,637	1,447	276	208
Oil cakes ...	9,992	6,838	7,310	307	202
Palm kernels ...	1,983	1,148	1,886	186	222
Palm oil ...	12,101	6,130	8,724	1,207	1,336
Pineapples canned ...	59,582	46,845	53,864	6,487	5,482
Rubber§ ...	459,836§	292,476	309,784§	41,074§	39,369§
Sago,—flour ...	7,648	2,850	4,746	467*	758
„ —pearl ...	2,646	1,430	3,115	210	527
„ —raw ...	4,420*	2,649*	4,121*	219*	577*
Tapioca,—flake ...	9,881	7,239	4,616	570	182
„ —flour ...	702*	126*	1,316*	2	61*
„ —pearl ...	17,297	11,608	10,728	2,097	1,346
Tuba root ...	569½	313½	381½	43	33

† hundreds in number.

* net imports.

§ production.

MALAYA RUBBER STATISTICS

ACREAGES OF TAPPABLE RUBBER NOT TAPPED ON ESTATES OF 100 ACRES AND OVER, FOR THE MONTH ENDING 31ST AUGUST, 1934.

STATE OR TERRITORY	Acreage of Tappable Rubber end 1933 (d)	ESTATES WHICH HAVE ENTIRELY CEASED TAPPING		ESTATES WHICH HAVE PARTLY CEASED TAPPING (a)		AREA OF TAPPABLE RUBBER NEVER BEEN TAPPED		Total (3) + (5)	Percentage of (9) to (2)
		Acreage (3)	Percentage of (3) to (2) (4)	Acreage (5)	Percentage of (5) to (2) (6)	Acreage (7)	Percentage of (7) to (2) (8)		
(1)	(2)							(9)	(10)
STRAITS SETTLEMENTS :—									
Province Wellesley	44,285	1,127	2.5	8,508	19.2	633	1.4	9,635	21.7
Dindings	7,368	112	1.5	841	11.4	193	2.6	953	12.9
Malacca	121,152	584	.5	16,527	13.6	3,130	2.6	17,111	14.1
Penang Island	1,366	184	13.5	398	29.1	201	14.7	582	42.6
Singapore Island	28,842	4,215	14.6	4,324	15.0	627	2.2	8,539	29.6
Total S.S.	203,013	6,222	3.0	30,598	15.1	4,784	2.4	36,820	18.1
FEDERATED MALAY STATES :—									
Perak	253,227	4,201	1.7	37,849	14.9	12,508	4.9	42,050	16.6
Selangor	310,003	3,621	1.2	43,801	14.1	11,255	3.6	47,422	15.3
Negri Sembilan	233,592	4,848	2.1	37,340	16.0	19,601	8.4	42,188	18.1
Pahang	46,712	4,367	9.3	15,457	33.1	9,609	20.6	19,824	42.4
Total F.M.S.	843,534	17,037	2.0	134,447	15.9	52,973	6.3	151,484	17.9
UNFEDERATED MALAY STATES :—									
Johore	365,400	11,081	3.0	23,609	6.5	22,090	6.0	34,690	9.5
Kedah (b)	126,588	4,051	3.2	26,277	20.8	23,318	18.4	30,328	24.0
Kelantan	25,793	2,061	8.0	2,180	8.4	5,418	21.0	4,241	16.4
Trengganu (b)	4,543	Nil	Nil	171	3.8	171	3.8	171	3.8
Perlis (c)	1,181	Nil	Nil	266	22.5	Nil	Nil	266	22.5
Total U.M.S.	523,505	17,193	3.3	52,503	10.0	50,997	9.7	69,696	13.3
TOTAL MALAYA	1,570,052	40,452	2.6	217,548	13.8	108,754	6.9	258,000	16.4

Notes :—(a) Area out of tapping on Estates which have partly ceased tapping refers to areas definitely being rested and excludes areas on any tapping round.

(b) Registered Companies only.

(c) Rentered quarterly.

(d) Figures are as reported by estate managers.

N.B.—The increase in the figures in columns 3, 5 and 7 for Pahang and in column 7 for Kedah as compared with previous returns is due to the inclusion of additional estates newly registered.

State or Territory	Stocks at beginning of month 1			Production by Estates of 100 acres and over		Production by Estates of less than 100 acres estimated 2		Imports			Exports including re-exports			Stocks at end of month	
	Ports	Dealer	Estates of 100 acres and over	during the month	January to August inclusive 1934	during the month	January to August inclusive 1934	during the month	January to August inclusive 1934	From Malay States & Labuan	Foreign	during the month	January to August inclusive 1934	Ports	Dealers
MALAY STATES :—	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Federated Malay States	...	9,752	8,869	11,877	93,524	8,973	70,518	Nil	Nil	Nil	Nil	12,554	6,188	118,411	58,482
Johore	...	1,914	2,281	3,642	29,553	4,739	35,198	Nil	2	Nil	270	1,645	5,906	12,998	53,483
Kedah	...	349	1,970	2,684	21,870	1,331	11,958	Nil	Nil	Nil	Nil	1,442	2,572	11,768	22,572
Perlis	...	41	10	13	111	14	269	Nil	Nil	Nil	Nil	Nil	34	Nil	379
Kelantan	...	150	168	279	1,878	601	5,516	Nil	Nil	319	Nil	99	692	732	6,922
Trengganu	...	55	50	187	1,773	93	884	Nil	Nil	Nil	Nil	Nil	280	Nil	2,657
Total Malay States	...	12,261	13,348	18,682	148,709	15,751	124,343	Nil	2	319	270	15,740	15,602	143,909	144,495
STRAITS SETTLEMENTS :—	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Malacca	...	2,260	803	1,556	10,866	1,060	...	Nil	4	Nil	Nil	2,661	...	26,396	...
Province Wellesley	...	1,054	490	545	4,605	226	...	Nil	Nil	Nil	133,210	7,280	...	64,929	...
Dindings	...	26	138	112	867	103	18,851	2,732	13,849	19,625	...	...	...	...	...
Penang	...	2,854	14,476	13	14	100	84	15,133	...	139,437	...	26,960	...	223,316	...
Singapore	...	5,070	50,623	203	1,443	144	...	17,865	13,849	159,066	133,210	36,901	Nil	314,641	...
Total Straits Settlements	...	7,924	68,439	2,410	17,881	2,526	18,851	17,865	13,851	159,385	133,480	52,641	15,602	458,550	144,495
TOTAL MALAYA	7,924	80,700	14,920	21,092	166,590	18,277	143,194	17,865	13,851	159,385	133,480	52,641	15,602	458,550	144,495

TABLE II
DEALERS' STOCKS, IN DRY TONS 3

Class of Rubber	Federated Malay States	S'pore	Penang	Provincial Wellesley Dindings	Johore	Kedah
20	21	22	23	24	25	26
DRY RUBBER	10,159	38,399	11,189	4,570	1,772	237
WET RUBBER	1,437	6,416	3,223	224	746	156
TOTAL	11,576	44,815	14,412	4,794	2,518	393

TABLE III
FOREIGN EXPORTS

PORTS	For month	January to August, 1934
Singapore	...	35,318
Penang	...	11,591
Port Swettenham	...	5,156
Malacca	...	576
MALAYA	...	52,641

TABLE IV
DOMESTIC EXPORTS 4

AREA	For month	January to August, 1934
Malay States	...	31,269
Straits Settlements	...	4,539
MALAYA	...	35,858

- Notes :—
1. Stocks on estates of less than 100 acres and stocks in transit on rail, road or local steamer are not ascertained.
 2. The production of estates of less than 100 acres is estimated from the formula : Production + Imports + Stocks at beginning of month = Exports + Stocks at end of month, + Consumption, i.e., Column (9) = Columns (15) + (16) + (19) + (20) + (21) + (22) - (4) - (5) - (6) - (7) - (11) - (12). For the Straits Settlements, Column (9) : figures for Singapore and Penang islands represent sales or exports as shown by cess paid and for the mainland represent as previously purchases by dealers from local estates of less than 100 acres, reduced by 15 % to terms of dry rubber.
 3. Dealers' stocks in the Federated Malay States are reduced to dry weights by the following fixed ratios: unsmoked sheet, 15% wet sheet, 25% scrap, lump, etc., 40%; stocks elsewhere are in dry weights as reported by the dealers themselves.
 4. Domestic exports are reported by the Customs Authorities for the Malay States and by the Registrars of Imports and Exports for Province Wellesley, Malacca, Dindings and Labuan. For Singapore and Penang island domestic exports are represented by sales or exports of rubber as shown by cess paid. (Figures for Brunei will) it is hoped, be included, in future returns.
 5. The above, with certain omissions, is the Report published by the Registrar - General of Statistics, S.S. and F.M.S., at Singapore on 24 September, 1934.

METEOROLOGICAL SUMMARY, MALAYA, AUGUST, 1934.

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LOCALITY.	AIR TEMPERATURE IN DEGREES FAHRENHEIT						EARTH TEMPERATURE		RAINFALL						BRIGHT SUNSHINE.				
	Means of		Absolute Extremes				At 1 foot	At 4 feet	Total.		Number of days.				Total.	Daily Mean.	Per cent.		
	A.	B.	Max.	Min.	Highest	Lowest					Precipitation .01 in or more	Precipitation .04 in or more	Thunder-storm	Fog morning obs.				Gale force 8 or more	
	°F	°F	°F	°F	°F	°F	°F	°F	in.	mm.	in.	mm.	Amt.	in.					
Railway Hill, Kuala Lumpur, Selangor	89.7	71.7	80.7	93	70	80	73	83.9	84.6	6.82	173.2	1.10	23	19	3	2	176.75	5.70	47
Bukit Jeram, Selangor	87.6	72.5	80.0	93	70	80	74	82.8	84.6	10.16	258.1	3.02	15	15	4	1	199.90	6.45	53
Sitiawan, Perak	89.7	72.4	81.1	92	71	86	75	84.0	85.2	3.13	79.5	0.68	13	11	1		186.90	6.03	49
Temerloh, Pahang	89.4	72.3	80.9	92	70	85	75	84.5	85.9	4.57	116.1	0.96	16	15		9	188.45	6.08	50
Kuala Lipis, Pahang	88.2	70.9	79.5	91	67	84	74	83.2	84.5	8.55	217.2	1.26	20	18	4	23	175.75	5.67	46
Kuala Pahang, Pahang	86.9	73.5	80.2	91	71	84	77	85.6	86.1	5.20	132.1	1.17	13	13	6	2	235.00	7.58	62
Kallang Aerodrome, S'pore	86.5	76.4	81.5	90	70	80	80	81.9	83.0	5.95	151.1	2.06	14	13	2	1	180.00	5.81	48
Butterworth, Province Wellesley	86.4	73.8	80.1	89	72	82	77	83.4	84.7	14.25	362.0	2.33	20	17	3	1	170.60	5.50	45
Bukit China, Malacca	84.2	73.5	78.9	87	71	79	76	82.9	83.9	6.27	159.3	2.41	14	10	2		169.95	5.48	45
Kluang, Johore	87.5	70.6	79.1	91	68	82	73	81.2	82.0	6.04	153.4	1.96	17	16	1	1	158.55	5.11	42
Bukit Lalang, Mersing, Johore	87.0	71.6	79.3	90	69	82	74	80.9	81.6	9.23	234.4	1.63	21	18	4	3	206.00	6.65	55
Alor Star, Kedah	86.4	73.8	80.1	91	72	79	76	85.3	85.9	17.35	440.7	2.78	23	21	5	1	171.40	5.53	45
Kota Bahru, Kelantan	89.4	73.3	81.3	92	71	87	76	84.3	84.9	9.22	234.2	1.86	17	13	8		209.55	6.76	55
Kuala Trengganu, Trengganu HILL STATIONS.	87.7	72.3	80.0	90	70	81	75	82.8	84.4	6.14	156.0	1.45	16	13	2		196.65	6.34	51
Fraser's Hill, Pahang 4268 ft.	74.0	62.3	68.1	78	60	68	64	71.3	72.1	6.15	156.2	1.17	18	18	4	5	162.45	5.24	43
Pahang Cameron Highlands, Tanah Rata, Pahang 4750 ft. ...	71.5	57.0	64.3	74	51	67	61	70.2	69.7	7.34	186.5	1.17	29	25		2	141.20	4.55	37
Cameron Highlands, Rhododendron Hill, Pahang 5120 ft. ...	70.6	59.1	64.9	74	57	64	61		7.83	198.9	1.27	29	24		2		146.30	4.72	38